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CALIFORNIA WATER CONTROVERSIES AND THE U.S. BUREAU OF RECLAMATION

HEARING

BEFORE THE

SUBCOMMITTEE ON WATER AND POWER

OF THE

COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

FIRST SESSION

ON

CALIFORNIA WATER CONTROVERSIES AND
THE U.S. BUREAU OF RECLAMATION

SACRAMENTO, CA, AUGUST 29, 1989

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CALIFORNIA WATER CONTROVERSIES AND THE U.S. BUREAU OF RECLAMATION

TUESDAY, AUGUST 29, 1989

U.S. Senate,
Subcommittee on Water and Power,
Committee on Energy and Natural Resources,
Sacramento, CA.

The subcommittee met, pursuant to notice, at 9:30 a.m., in room 112, California State Capital, Hon. Bill Bradley presiding.

OPENING STATEMENT OF HON. BILL BRADLEY, U.S. SENATOR FROM NEW JERSEY

Senator Bradley. The subcommittee will come to order. I'd like to welcome the witnesses to this oversight hearing of the U.S. Senate Subcommittee on Water and Power. We're privileged today to be joined by Congressman Vic Fazio, who as it happens represents a nearby district affected by many of the Bureau of Reclamation's decisions.

Before we begin, I'd like to express my appreciation and thanks to Senator Dave Roberti, who made it possible for us to use this room today. The Subcommittee and I, in particular, are very grateful.

The Subcommittee on Water and Power has oversight and legislative responsibility for reclamation projects, Federal power marketing agencies, irrigation, and groundwater: topics that touch many areas and activities here in California.

The purpose of this oversight hearing is to focus on the Bureau of Reclamation's role in California's many water controversies. The subcommittee has invited as witnesses a broad range of Californians involved in planning for the State's future water use. What we hope to hear are constructive, realistic suggestions on how the Bureau might play the most helpful, responsible role in your State's efforts to meet present and future water needs.

The Bureau is a substantial presence in California, as most of you know, and its projects have provided a foundation for much of this State's extraordinary growth and economic strength. The Bureau of Reclamation's dams on the Colorado—Glen, Boulder, Davis, Parker—store and regulate water vital to Southern California cities and agriculture.

The Central Valley Project provides urban drinking water and sustains a unique agricultural economy that produces hundreds of different crops, employs thousands of people, and generates billions of dollars every year.

Colorado River and CVP hydroelectric facilities provide clean, renewable power, and the Bureau's reservoirs offer some of the best recreation in California.

But if that were all the story, we probably wouldn't be here today. The Bureau's California legacy is not entirely what any of us would like it to be. The State's fish, wildlife, and water quality have borne a heavy burden for Federal water development.

As California plans its future, the benefits attributable to Bureau projects have to be measured against environmental and other costs. California faces a tremendous challenge in striking a balance between environmental protection and economic productivity. The question before this Subcommittee today is the Bureau's appropriate place in your State's efforts to strike that balance.

I'd like to make the point that the Subcommittee is here today to learn, and to listen. I encourage all of you to be as direct and as positive as you can possibly be in your suggestions, opinions or criticism. I look forward to hearing the witnesses' recommendations today. The whole hearing record will be a permanent part of not only the Subcommittee, but the Committee of Energy and Natural Resources of the U.S. Senate. It will provide, I think, a valuable record for our further deliberations.

Although this is a U.S. Senate Subcommittee hearing, we are joined by Congressman Vic Fazio, and Vic, if you'd like to say anything to open, please feel free to do so.

STATEMENT OF HON. VIC FAZIO, U.S. REPRESENTATIVE FROM CALIFORNIA

Mr. Fazio. Well, thank you, Senator Bradley, very much, first for providing me an opportunity to be here, but I think on behalf of all the diverse California water interests that are seated before you, thank you for taking the time to come to California to become better educated about our problems. You have a tremendous ability when you focus on a problem to reach some very important conclusions. Tax reform is perhaps the most notable accomplishment of your career. Your leadership on third world debt is another effort that I hope will soon be bearing fruit.

But as a representative of a non-Reclamation state, you have a tremendous amount of impact on us. Your jurisdiction is a very important one to all of us. I believe that, while I'm here today to be educated as you are, you are one of the more important players in the solution to an awful lot of our problems that you'll hear described by these four panels today.

We don't do enough oversight in the legislative process these days, and the evidence of that is all over the place. Oversight is something I think we don't do enough on the Appropriations Committee. I'm a member of the Energy and Water Subcommittee on the House Appropriations Committee, and I'm very pleased to be able to piggy-back on your hearing today, and to learn what I can, so that when we budget for the Bureau, and the other agencies that affect California water, we will do so with a common base of information.

I thank you very much for letting me have the privilege of sitting here with you today.

Senator **Bradley**. Thank you very much, Congressman Fazio, for joining us. The hearing will take place with four panels to be heard sequentially. Each witness should limit his or her presentation to ten minutes, as you have been warned, so that we leave the maximum amount of time for questions. We hope to get through at least two of the panels this morning, break for lunch, and come back in the afternoon with the other two. And again, I would encourage you to be as direct and as speculative as possible, if those aren't contradictory instructions.

The Committee will begin now with panel one, which consists of W. Don Maughan, chairman, Water Resources Control Board of the State of California; David N. Kennedy, who is the director of the Department of Water Resources, State of California; and Peter Bontadelli, director of California Department of Fish and Game.

Gentlemen, welcome to the Subcommittee. Why don't we proceed in the order that I read your names. Mr. Maughan, why don't you go first.

STATEMENT OF W. DON MAUGHAN, CHAIRMAN, CALIFORNIA WATER RESOURCES CONTROL BOARD

Mr. **Maughan**. All right, Mr. Chairman, I appreciate being here. Your invitation to this hearing asked that I speak to several different topics, concluding with some observations on the Bureau of Reclamation's new role. I would like to arrange my remarks in the order that you presented them to me in your invitation.

The State Water Board has two broad functions; reasonable protection of the quality of the State's waters, and the administration of the statutory appropriative water rights system. In both of these functions, indeed, in all of our State Water Board's actions, we are guided by the California State Constitution's provisions prohibiting the waste or unreasonable use of water.

Additionally, recent case law has clarified, or extended, depending on your point of view, the application of the concept of public trust to the State's water rights system. As the State agency that administers the statutory water rights system, we must heed that body of law and incorporate it into our decisions.

I want to skip now to our Bay/Delta proceeding. Water quality and water rights are almost always linked, but the connection is clearest in our proceedings regarding the San Francisco Bay and the Delta Estuary.

Our goal in the Bay/Delta proceeding, if I'm limited to just one goal, is to balance the competing demands for water in California in a way such that all interested parties can accept that decision into the next century. We realize this can be a very difficult goal.

I'd like to spend just a moment explaining the importance of the Delta to California's water issues, so that the Subcommittee will see why our goal can be so difficult.

To begin with, almost all of California is semi-arid. Most parts of the State receive very little or no rainfall from May through September. For this State to develop, water projects are needed. These projects store spring runoff for use later in the dry months. Most of California's population lives south of the Tehachapi Mountains, and much of California's agricultural production occurs in the San Joaquin Valley.

These areas are south of the Delta, and and most of the State's water originates north of the Delta. Therefore, the water projects must also transport water over long distances to the ultimate users. The Delta, most specifically the Delta pumps of the Bureau of Reclamation's Central Valley Project and the State Department of Water Resources' State Water Project, is the connection point between the water collection function and the water transportation function.

Complicating matters is the fact that the Delta is part of a Bay Estuary system, one that reaches from the Golden Gate all the way up to the City of Sacramento. As you know, estuaries are subject to tidal movement and to intrusion of salt water. Therefore, the point to which salt moves up the estuary depends in large part on the volume of fresh water flowing through the Delta.

But the Delta is much more than a forebay to the Project's aqueducts. Delta land is river bottom, rich agricultural land under intense cultivation. Water for these fields usually comes from diversion directly from the Delta's waterways. The Delta is part of the Pacific Flyway, used by hundreds of thousands of migrating birds on their season's travel. Further, the Delta and the Bay form an ecological zone important to the survival of anadromous fish, such as chinook salmon, fish important to California for commerce, for recreation. Completing the picture, part of the estuary forms an industrial corridor, and firms along the estuary use water for industrial activities.

So the stage for the conflict is set. Water users along the projects' aqueducts want reliable deliveries of high quality water, with little or no limit placed on the quantity that can be shipped to them. Groups interested in protecting the fisheries and wildlife of the State want adequate flows leaving the Delta and entering the Bay. Water users within the Delta want good quality water, but not so much of a volume of water as to threaten the stability of the levees that protect their land.

The State Board has divided its Bay/Delta proceedings into phases; the water quality phase, the scoping phase, and the water right phase.

In the water quality phase, we will adopt a water quality control plan for the Bay and Delta Estuary. In this plan, we will be focusing on the control of salinity and water temperature. We may also consider trihalomethane precursors. The plan will include water quality objectives, to the extent supported by evidence, to protect both the beneficial uses in the Bay and the Delta, and the beneficial of the Bay and Delta waters. We anticipate adopting the plan in July of 1990.

Following adoption of that plan, the State Board will enter the scoping phase. This phase is intended to develop several optional control measures for consideration by the State Board. This phase will culminate in the publication of a draft environmental impact report, which is a document similar to the environment impact statement under NEPA. After the draft EIR has been circulated for public review, the State Board will enter its water right phase.

Here the State Board will begin a proceeding in which it will receive testimony and evidence on the draft EIR and the water rights matters to which it applies. The State Board will proceed as a quasi judicial body when taking testimony and evidence on the water rights matters.

At the conclusion of this phase, the State Board will adopt any needed water right decision. This decision will be based on the State Board's authority under statutory water rights law, the State Constitution, and the public trust doctrine, to review, and if needed, to place conditions on all water rights in the watershed of the Bay and Delta. As a holder of water rights, the Bureau will be subject to the State Board's water right decision.

My reading of the court's ruling concerning the public trust doctrine is that the State retains the duty to actively consider that doctrine in every water right matter before it. Further, the State retains this authority without regard to past decisions.

Does this mean that everyone's water right is subject to amendment to satisfy the public trust? I believe the answer is yes, here in California. Moreover, I also believe the courts would find that unreasonable protection of instream uses as inappropriate as providing these with no protection.

Having reviewed these topics as background, the question becomes, what impact does all this have on the Bureau? The answer is twofold. First, since the Bureau holds water rights in California, the Bureau's rights are subject to review and modification by the State Board as it exercises its affirmative duty to provide reasonable protection for the public trust.

Second, to the extent the Bureau operates ancillary facilities, and I'm thinking of San Luis Drain and Kesterson, which have resulted in the discharge of pollutants to California's waters, then the Bureau's operations fall under the State Board's water quality control authority.

Now we come to the topic of the Bureaus' new direction. I read the excerpt you forwarded in preparation for this hearing. Frankly, I was a bit puzzled. Historically, the Bureau has been a water supply agency. It has developed water resources by damming rivers, building canals and aqueducts, and then operating those dams, canals, and aqueducts to provide water to users, primarily agricultural operators

The new direction statement by the Bureau speaks of changing the basis of the Bureau's mission, but not its actual functions. I believe the Bureau will not emphasize construction of new facilities, but I do believe the Bureau will continue to operate dams, canals, and aqueducts. The question, then, is one of emphasis.

I think the Bureau's new direction will mean, in practice, that it will be more aware that its water supply activities have environmental impacts and that it will work harder to ensure that those impacts are no more detrimental to the environment than need be, given the Bureau's basic mission of supplying water.

We certainly welcome a balanced view by a major influence in California water issues. However, we are reluctant to offer advice on how the Bureau may accomplish this change in emphasis. Our standing policy, as a regulatory agency, is to determine, as best we can, given the information before us, a proper balance between the competing uses for California's water. We make that balance apparent in water right permit terms and conditions, and in conditions that apply to discharges of wastes to California waters. But having set those terms and conditions, we leave it to the permittees to decide how best to satisfy those conditions.

I thank you for the opportunity to testify on these issues.

Senator **Bradley**. Thank you very much, Mr. Maughan.

[The prepared statement of Mr. Maughan follows:]

TESTIMONY
OF
W. DON MAUGHAN, CHAIRMAN
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD
BEFORE THE SUBCOMMITTEE ON WATER AND POWER
SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES
AUGUST 29, 1989
SACRAMENTO, CALIFORNIA

THANK YOU, MR. CHAIRMAN AND MEMBERS.

YOUR INVITATION TO THIS HEARING ASKED THAT I SPEAK TO SEVERAL DIFFERENT TOPICS, CONCLUDING WITH SOME OBSERVATIONS ON THE BUREAU OF RECLAMATION'S NEW ROLE. I WOULD LIKE TO ARRANGE MY REMARKS IN THE ORDER THAT YOU PRESENTED THEM TO ME IN YOUR INVITATION.

GENERAL DESCRIPTION OF THE MANDATE OF THE STATE BOARD

TO BEGIN, YOU ASKED THAT I PROVIDE A GENERAL DESCRIPTION OF THE STATE WATER RESOURCES CONTROL BOARD'S MANDATE.

THE STATE BOARD HAS TWO BROAD FUNCTIONS: REASONABLE PROTECTION OF THE QUALITY OF THE STATE'S WATERS AND ADMINISTRATION OF THE STATUTORY APPROPRIATIVE WATER RIGHTS SYSTEM.

IN BOTH THESE FUNCTIONS -- INDEED, IN ALL OF THE STATE BOARD'S ACTIONS -- WE ARE GUIDED BY THE CALIFORNIA STATE CONSTITUTION'S PROVISIONS PROHIBITING THE WASTE OR UNREASONABLE USE OF WATER.

ADDITIONALLY, RECENT CASE LAW HAS CLARIFIED -- OR EXTENDED, DEPENDING ON YOUR POINT OF VIEW -- THE APPLICATION OF THE CONCEPT OF PUBLIC TRUST TO THE STATE'S WATER RIGHTS SYSTEM. AS THE STATE AGENCY THAT ADMINISTERS THE STATUTORY WATER RIGHTS SYSTEM, WE MUST HEED THAT BODY OF LAW AND INCORPORATE IT INTO OUR DECISIONS.

IN PROTECTING THE QUALITY OF THE STATE'S WATERS, THE STATE BOARD AND REGIONAL WATER QUALITY CONTROL BOARDS IMPLEMENT THE FEDERAL CLEAN WATER ACT, AS WELL AS APPLICABLE STATE LAW, MOST NOTABLY THE PORTER-COLOGNE WATER QUALITY CONTROL ACT. BROADLY SPEAKING, THE STATE BOARD SETS POLICY FOR WATER QUALITY, AND THE REGIONAL BOARDS IMPLEMENT THAT POLICY THROUGH REGULATION OF DISCHARGES OF WASTES TO THE STATE'S WATERS.

THE STATE BOARD IS RESPONSIBLE FOR STATEWIDE WATER QUALITY PLANNING. TO FULFILL THAT RESPONSIBILITY, THE STATE BOARD DIRECTS NEEDED WATER QUALITY STUDIES AND INVESTIGATIONS.

REGIONAL BOARDS ADOPT WATER QUALITY CONTROL PLANS FOR BASINS WITHIN THEIR JURISDICTION; THE STATE BOARD ADOPTS WATER QUALITY CONTROL PLANS FOR AREAS OF STATEWIDE SIGNIFICANCE -- THE SAN FRANCISCO BAY AND ESTUARY AND THE STATE'S COASTAL WATERS.

TO HELP PROTECT CALIFORNIA'S WATERS, THE STATE BOARD ALSO HELPS FINANCE -- THROUGH A SERIES OF GRANT AND LOAN PROGRAMS -- CONSTRUCTION OF A VARIETY OF CAPITAL PROJECTS TO TREAT WASTEWATERS. THE LARGEST OF THESE PROGRAMS IS THE FEDERAL SUBVENTION PROGRAM UNDER TITLES II AND VI OF THE CLEAN WATER ACT. IN THIS PROGRAM, THE STATE BOARD GRANTS AND LENDS FUNDS TO LOCAL GOVERNMENTS FOR

CONSTRUCTION OF SEWAGE TREATMENT WORKS. THE STATE BOARD ALSO FUNDS MANY WATER QUALITY STUDIES AND INVESTIGATIONS AND SOME CLEANUP ACTIVITIES.

THE STATE BOARD ALSO ADMINISTERS THE STATUTORY WATER RIGHTS SYSTEM IN CALIFORNIA. YOU MAY BE AWARE THAT, IN CALIFORNIA, WATER RIGHTS CAN HAVE A VARIETY OF LEGAL BASES. MOST ANCIENT ARE RIPARIAN RIGHTS, WHICH STEM FROM COMMON LAW. IN CALIFORNIA, WE ALSO HAVE APPROPRIATIVE RIGHTS THAT PRE-DATE THE CURRENT PERMIT SYSTEM. WE AFFECTIONATELY CALL THESE "PRE-1914 RIGHTS," BECAUSE THE CURRENT PERMIT SYSTEM WAS ESTABLISHED IN STATUTE IN 1914. FINALLY, WE HAVE THE CURRENT PERMIT SYSTEM, WHICH IS ESTABLISHED IN STATUTE.

THE STATE BOARD ADMINISTERS THIS LAST SET OF RIGHTS. IN THIS CONTEXT, "ADMINISTRATION" MEANS THAT WE ACCEPT APPLICATIONS TO DIVERT OR STORE WATER; HOLD HEARINGS ON THE EFFECTS OF THOSE PROPOSED DIVERSIONS; ISSUE PERMITS WHEN WARRANTED; WRITE CONDITIONS ON THE USE OF THOSE PERMITS, WHEN WARRANTED; AND REFEREE DISPUTES ABOUT EXISTING WATER RIGHTS HELD UNDER THE PERMIT SYSTEM. DISPUTES OVER WATER RIGHTS THAT ARE BASED IN RIPARIAN OR PRE-1914 RIGHTS USUALLY ARE RESOLVED BY COURTS, BUT WE ARE FREQUENTLY ASKED TO PROVIDE THE COURT WITH TECHNICAL AND EXPERT OPINION. THE STATE BOARD ALSO TAKES ACTION TO ENSURE THAT RIPARIAN AND PRE-1914 RIGHTS COMPLY WITH THE CONSTITUTIONAL PROHIBITION ON WASTE OR UNREASONABLE USE.

THE BUREAU OF RECLAMATION HOLDS WATER RIGHTS UNDER THE STATUTORY PERMIT SYSTEM.

GOAL OF BAY/DELTA PROCEEDING

WITH THAT BACKGROUND IN MIND, YOU ASKED THAT I DESCRIBE THE GOAL OF THE CURRENT BAY-DELTA PROCEEDINGS.

WATER QUALITY AND WATER RIGHTS ARE ALWAYS LINKED, BUT THE CONNECTION IS CLEAREST IN OUR PROCEEDINGS REGARDING SAN FRANCISCO BAY AND THE DELTA ESTUARY.

OUR GOAL IN THE BAY-DELTA PROCEEDING -- IF I'M LIMITED TO JUST ONE GOAL -- IS TO BALANCE THE COMPETING DEMANDS FOR WATER IN CALIFORNIA IN A WAY THAT ALL INTERESTED PARTIES CAN ACCEPT INTO THE NEXT CENTURY. WE REALIZE THIS CAN BE VERY DIFFICULT GOAL.

I'D LIKE TO SPEND JUST A MOMENT EXPLAINING THE IMPORTANCE OF THE DELTA TO CALIFORNIA WATER ISSUES, SO THE SUBCOMMITTEE WILL SEE WHY OUR GOAL CAN BE SO DIFFICULT.

TO BEGIN, ALMOST ALL OF CALIFORNIA IS SEMI-ARID. MOST PARTS OF THE STATE RECEIVE VERY LITTLE OR NO RAINFALL FROM MAY THROUGH SEPTEMBER. FOR THIS STATE TO DEVELOP, WATER PROJECTS ARE NEEDED. THESE PROJECTS STORE SPRING RUNOFF FOR USE LATER IN THE DRY MONTHS. MOST OF CALIFORNIA'S POPULATION LIVES SOUTH OF THE TEHACHAPI MOUNTAINS, AND MUCH OF CALIFORNIA'S AGRICULTURAL PRODUCTION OCCURS IN THE SAN JOAQUIN VALLEY. THESE AREAS ARE SOUTH OF THE DELTA, AND MOST OF THE STATE'S WATER ORIGINATES NORTH OF THE DELTA. THEREFORE, THE WATER PROJECTS MUST ALSO TRANSPORT WATER OVER LONG DISTANCES TO THE ULTIMATE USERS. THE DELTA -- MOST SPECIFICALLY THE DELTA PUMPS OF THE BUREAU OF RECLAMATION'S CENTRAL VALLEY PROJECT AND THE STATE DEPARTMENT OF WATER RESOURCES' STATE WATER PROJECT -- IS THE CONNECTION POINT BETWEEN THE WATER COLLECTION FUNCTION AND THE WATER TRANSPORTATION FUNCTION.

COMPLICATING MATTERS IS THE FACT THAT THE DELTA IS PART OF A BAY -- ESTUARY SYSTEM, ONE THAT REACHES FROM THE GOLDEN GATE ALL THE WAY UP TO THE CITY OF SACRAMENTO. ESTUARIES ARE SUBJECT TO TIDAL MOVEMENT AND TO INTRUSION OF SALT

WATER. THEREFORE, THE POINT TO WHICH SALT WATER MOVES UP THE ESTUARY DEPENDS IN LARGE PART ON THE VOLUME OF FRESH WATER FLOWING THROUGH THE DELTA.

BUT THE DELTA IS MUCH MORE THAN A FOREBAY TO THE PROJECT'S AQUEDUCTS. DELTA LAND IS RIVER BOTTOM, RICH AGRICULTURAL LAND UNDER INTENSE CULTIVATION. WATER FOR THESE FIELDS USUALLY COMES FROM DIVERSION DIRECTLY FROM THE DELTA'S WATERWAYS. THE DELTA IS PART OF THE PACIFIC FLYWAY, USED BY THOUSANDS OF MIGRATING BIRDS ON THEIR SEASONAL TRAVELS. FURTHER, THE DELTA AND THE BAY FORM AN ECOLOGICAL ZONE IMPORTANT TO THE SURVIVAL OF ANADROMOUS FISH -- FISH IMPORTANT TO CALIFORNIA FOR COMMERCE AND FOR RECREATION. COMPLETING THE PICTURE, PART OF THE ESTUARY FORMS ON INDUSTRIAL CORRIDOR, AND FIRMS ALONG THE ESTUARY USE WATER FOR INDUSTRIAL ACTIVITIES.

SO THE STAGE FOR THE CONFLICT IS SET. WATER USERS ALONG THE PROJECTS' AQUEDUCTS WANT RELIABLE DELIVERIES OF HIGH QUALITY WATER, WITH LITTLE OR NO LIMIT PLACED ON THE QUANTITY THAT CAN BE SHIPPED TO THEM. GROUPS INTERESTED IN PROTECTING THE FISHERIES AND WILDLIFE OF THE STATE WANT ADEQUATE FLOWS LEAVING THE DELTA AND ENTERING THE BAY. WATER USERS WITHIN THE DELTA WANT GOOD QUALITY WATER, BUT NOT SO MUCH OF A VOLUME OF WATER AS TO THREATEN THE STABILITY OF THE LEVEES THAT PROTECT THEIR LAND.

NOW, IF CALIFORNIA HAD PLENTY OF WATER TO MEET ALL THESE DEMANDS, THE STATE BOARD WOULD HAVE AN EASY TASK. AND YOU MAY HEAR TODAY THAT CALIFORNIA DOES INDEED HAVE ENOUGH WATER. BUT THAT STATEMENT IS USUALLY FOLLOWED BY A QUALIFICATION: "IF WE MANAGE IT WISELY." THE DIFFICULTY FACING THE STATE BOARD LIES IN THAT QUALIFICATION.

TO RETURN TO OUR GOAL. THE STATE BOARD HAS DIVIDED ITS TASK IN THE BAY-DELTA PROCEEDING INTO PHASES. BY NAME AND IN SEQUENCE, THESE PHASES ARE:

O THE WATER QUALITY PHASE;
O THE SCOPING PHASE; AND
O THE WATER RIGHT PHASE.

IN THE WATER QUALITY PHASE, WE WILL ADOPT A WATER QUALITY CONTROL PLAN FOR THE BAY AND DELTA ESTUARY. IN THIS PLAN, WE WILL BE FOCUSSING ON CONTROL OF SALINITY AND WATER TEMPERATURE. WE MAY ALSO INCLUDE CONSIDERATION OF TRIHALOMETHANE PRECURSORS. THIS PLAN WILL INCLUDE WATER QUALITY OBJECTIVES, TO THE EXTENT SUPPORTED BY EVIDENCE, TO PROTECT BOTH THE BENEFICIAL USES IN THE BAY AND DELTA AND THE BENEFICIAL USES OF THE BAY AND DELTA WATERS. THE DISTINCTION LIES, AS YOU CAN SEE, IN THE DIFFERENT GEOGRAPHIC LOCATIONS OF THE USES OF THE WATERS OF THE BAY AND DELTA. WE ANTICIPATE ADOPTION OF THE PLAN IN JULY 1990.

AT THE SAME TIME, WE WILL BE DEVELOPING A POLLUTANT POLICY DOCUMENT. THIS DOCUMENT WILL SET WATER QUALITY POLICY, TO BE IMPLEMENTED BY REGIONAL BOARDS. WE EXPECT FINAL ADOPTION OF THIS DOCUMENT TO OCCUR BEFORE THE ADOPTION OF THE WATER QUALITY PLAN.

FOLLOWING ADOPTION OF THE PLAN, THE STATE BOARD WILL ENTER THE SCOPING PHASE. THE STATE BOARD IS AWARE THAT SOME BENEFICIAL USES OF BAY AND DELTA WATERS MAY REQUIRE CONTROL MEASURES IN ADDITION TO THOSE WHICH WILL SATISFY THE WATER QUALITY OBJECTIVES MENTIONED ABOVE. THIS PHASE IS INTENDED TO DEVELOP SEVERAL OPTIONAL CONTROL MEASURES FOR CONSIDERATION BY THE STATE BOARD. THIS PHASE WILL CULMINATE IN THE PUBLICATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT (EIR), WHICH IS A DOCUMENT SIMILAR TO AN ENVIRONMENTAL IMPACT STATEMENT UNDER NEPA. THE DRAFT EIR

WILL CONTAIN THE BEST OF THE OPTIONAL CONTROL MEASURES DEVELOPED DURING THE SCOPING PHASE.

AFTER THE DRAFT EIR HAS BEEN CIRCULATED FOR PUBLIC REVIEW, THE STATE BOARD WILL ENTER ITS WATER RIGHTS PHASE. HERE THE STATE BOARD WILL BEGIN A PROCEEDING IN WHICH IT RECEIVES TESTIMONY AND EVIDENCE ON THE DRAFT EIR AND ON THE WATER RIGHTS MATTERS TO WHICH IT APPLIES. THE STATE BOARD WILL PROCEED AS A QUASI-JUDICIAL BODY WHEN TAKING TESTIMONY AND EVIDENCE ON THE WATER RIGHTS MATTERS. AT THE CONCLUSION OF THIS PHASE, THE STATE BOARD WILL ADOPT ANY NEEDED WATER RIGHTS DECISION. THIS DECISION WILL BE BASED ON THE STATE BOARD'S AUTHORITY -- UNDER STATUTORY WATER RIGHTS LAW, THE STATE CONSTITUTION, AND THE PUBLIC TRUST DOCTRINE -- TO REVIEW AND, IF NEEDED, TO PLACE CONDITIONS ON ALL WATER RIGHTS HELD IN THE WATERSHED OF THE BAY AND DELTA.

AS A HOLDER OF WATER RIGHTS, THE BUREAU WILL BE SUBJECT TO THE STATE BOARD'S WATER RIGHT DECISION.

IMPACT OF PUBLIC TRUST DOCTRINE ON APPROPRIATIVE AND RIPARIAN WATER RIGHTS IN CALIFORNIA

I'VE JUST MENTIONED THE STATE BOARD'S AUTHORITY UNDER THE PUBLIC TRUST DOCTRINE TO REVIEW AND, IF NEEDED, TO PLACE CONDITIONS ON ALL WATER RIGHTS IN CALIFORNIA. YOU HAVE ASKED FOR MY ASSESSMENT OF THE IMPACT OF THE DOCTRINE ON APPROPRIATIVE AND RIPARIAN WATER RIGHTS IN CALIFORNIA.

THE SHORT ANSWER IS THIS. THE SUPREME COURT HAS RULED THAT UNDER THE PUBLIC TRUST DOCTRINE THE STATE BOARD HAS BOTH THE AUTHORITY AND THE RESPONSIBILITY TO EXAMINE EVERY WATER RIGHT IN CALIFORNIA TO ENSURE THE PROTECTION OF THE PUBLIC TRUST, REGARDLESS OF THAT RIGHT'S FOUNDATION IN LAW. FURTHER, I BELIEVE THE COURT'S RULING MEANS THAT THE STATE BOARD MUST PLACE FEASIBLE CONDITIONS ON WATER RIGHTS -- AGAIN, WITHOUT REGARD TO THAT RIGHT'S FOUNDATION IN LAW -- WHEN CONDITIONS ARE NEEDED TO PROTECT THE PUBLIC TRUST.

THIS IS A THORNY TOPIC, AND I WOULD LIKE TO AMPLIFY ON MY COMMENTS.

WE SHOULD BEGIN BY RECOGNIZING THAT THE PUBLIC TRUST DOCTRINE ORIGINATES IN COMMON LAW AND HAS BEEN CLARIFIED BY RECENT CASE LAW. THEREFORE, THE PUBLIC TRUST DOCTRINE IS NOT SET OUT IN ANY COMPLETE FORM IS STATUTE. ADDITIONALLY, WE SHOULD NOTE THAT THE U.S. SUPREME COURT, IN ONE OF THE LANDMARK CASES IN THE DEVELOPMENT OF THE DOCTRINE IN THE UNITED STATES (ILLINOIS CENTRAL RAILROAD COMPANY V. ILLINOIS), DECLARED THAT THE STATE "...CAN NO MORE ABDICATE ITS TRUST OVER PROPERTY IN WHICH THE WHOLE PEOPLE ARE INTERESTED...THAN IT CAN ABDICATE ITS POLICE POWERS IN THE ADMINISTRATION OF GOVERNMENT AND THE PRESERVATION OF THE PEACE."

IN THE AUDUBON DECISION IN 1983, THE CALIFORNIA SUPREME COURT RULED THAT, UNDER THE PUBLIC TRUST DOCTRINE, THE STATE RETAINS A CONTINUING SUPERVISORY CONTROL OVER RIGHTS IN FLOWING WATERS. THE COURT'S DECISION MAKES NO EXPLICIT DISTINCTION BETWEEN TYPES OF RIGHTS. THEREFORE, I BELIEVE THIS DECISION APPLIES TO ALL WATER RIGHTS HELD IN CALIFORNIA, WITHOUT REGARD TO THE LEGAL BASIS FOR THOSE RIGHTS.

THE COURT'S RULING CONTAINED SEVERAL IMPORTANT ELEMENTS. FOR OUR PURPOSES HERE, THEY ARE:

FIRST, THE STATE HAS CONTINUING SUPERVISORY CONTROL OVER APPROPRIATIVE WATER RIGHTS. INDEED, THE COURT LABELS THIS CONTROL A "DUTY," AND DECLARES THAT THE

STATE IS NOT CONFINED BY PAST DECISIONS ON WATER RIGHTS ALLOCATIONS. FURTHER, THE COURT DECLARES THAT THIS POWER TO RECONSIDER PAST DECISIONS EXISTS EVEN IF THE PREVIOUS DECISION INCLUDED A CONSIDERATION OF PUBLIC TRUST ISSUES.

SECOND, THIS DUTY IS "...(A)N AFFIRMATIVE DUTY TO TAKE PUBLIC TRUST INTO ACCOUNT IN THE PLANNING AND ALLOCATION OF WATER RESOURCES, AND TO PROTECT PUBLIC TRUST USES WHENEVER FEASIBLE." THE STATE BOARD, ACTING FOR THE LEGISLATURE, IS OBLIGED TO KEEP PROTECTION OF THE PUBLIC TRUST FOREMOST IN ITS CONSIDERATIONS ON WATER RIGHTS.

THIRD, THE PROTECTION OF PUBLIC TRUST USES IS TO BE TEMPERED BY -- TO BE BALANCED BY -- CONSIDERATION OF FEASIBILITY. THE COURT WAS WELL AWARE THAT CALIFORNIA HAS DEVELOPED PRECISELY BECAUSE WATER HAS BEEN DIVERTED FROM SOURCE STREAMS AND TRANSPORTED LONG DISTANCES TO ULTIMATE USERS. THE COURT'S DECISION CLEARLY ALLOWS THE STATE TO LICENSE WATER APPROPRIATION EVEN THOUGH SUCH APPROPRIATION MAY HARM PUBLIC TRUST USES IN THE SOURCE STREAM.

THEREFORE, MY READING OF THE COURT'S RULING IS THAT THE STATE RETAINS THE DUTY TO ACTIVELY CONSIDER THE PUBLIC TRUST IN EVERY WATER RIGHT MATTER BEFORE IT. FURTHER, THE STATE RETAINS THIS AUTHORITY WITHOUT REGARD TO PAST DECISIONS. DOES THIS MEAN THAT EVERYONE'S WATER RIGHT IS SUBJECT TO AMENDMENT TO SATISFY THE PUBLIC TRUST? I BELIEVE THE ANSWER IS YES. HOWEVER, I ALSO BELIEVE THE COURTS WOULD FIND THAT UNREASONABLE PROTECTION OF INSTREAM USES AS INAPPROPRIATE AS PROVIDING THESE USES WITH NO PROTECTION.

HAVING REVIEWED THOSE TOPICS AS BACKGROUND, THE QUESTION BECOMES: WHAT IMPACT DOES ALL THIS HAVE ON THE BUREAU? THE ANSWER IS TWOFOLD. FIRST, SINCE THE BUREAU HOLDS WATER RIGHTS IN CALIFORNIA, THE BUREAU'S RIGHTS ARE SUBJECT TO REVIEW AND MODIFICATION BY THE STATE BOARD AS IT EXERCISES ITS AFFIRMATIVE DUTY TO PROVIDE REASONABLE PROTECTION FOR THE PUBLIC TRUST. SECOND, TO THE EXTENT THE BUREAU OPERATES ANCILLARY FACILITIES -- I'M THINKING OF SAN LUIS DRAIN AND KESTERSON -- WHICH HAVE RESULTED IN THE DISCHARGE OF POLLUTANTS TO CALIFORNIA'S WATERS, THEN THE BUREAU'S OPERATIONS FALL UNDER THE STATE BOARD'S WATER QUALITY CONTROL AUTHORITY.

NOW WE COME TO THE TOPIC OF THE BUREAU'S NEW DIRECTION. I READ THE EXCERPT YOU FORWARDED IN PREPARATION FOR THIS HEARING. FRANKLY, I WAS A BIT PUZZLED. HISTORICALLY, THE BUREAU HAS BEEN A WATER SUPPLY AGENCY. IT HAS DEVELOPED WATER RESOURCES BY DAMMING RIVERS AND BUILDING CANALS AND AQUEDUCTS, AND THEN OPERATING THOSE DAMS, CANALS, AND AQUEDUCTS TO PROVIDE WATER TO USERS, PRIMARILY AGRICULTURAL OPERATORS. THE NEW DIRECTION STATEMENT BY THE BUREAU SPEAKS OF CHANGING THE BASIS OF THE BUREAU'S MISSION, BUT NOT ITS ACTUAL FUNCTIONS. I BELIEVE THE BUREAU WILL NOT EMPHASIZE CONSTRUCTION OF NEW FACILITIES, BUT I DO BELIEVE THE BUREAU WILL CONTINUE TO OPERATE DAMS, CANALS, AND AQUEDUCTS. THE QUESTION THEN IS ONE OF EMPHASIS. I THINK THE BUREAU'S NEW DIRECTION WILL MEAN, IN PRACTICE, THAT IT WILL BE MORE AWARE THAT ITS WATER SUPPLY ACTIVITIES HAVE ENVIRONMENTAL IMPACTS AND THAT IT WILL WORK HARDER TO ENSURE THAT THOSE IMPACTS ARE NO MORE DETRIMENTAL TO THE ENVIRONMENT THAN NEED BE, GIVEN THE BUREAU'S BASIC MISSION OF SUPPLYING WATER.

WE CERTAINLY WELCOME A BALANCED VIEW BY A MAJOR INFLUENCE IN CALIFORNIA WATER ISSUES. HOWEVER, WE ARE RELUCTANT TO OFFER ADVICE ON HOW THE BUREAU MAY ACCOMPLISH THIS CHANGE IN EMPHASIS. OUR STANDING POLICY, AS A REGULATORY AGENCY, IS TO DETERMINE -- AS BEST WE CAN, GIVEN THE INFORMATION BEFORE US -- A PROPER BALANCE BETWEEN ALL THE COMPETING USES FOR CALIFORNIA'S WATER. WE MAKE THAT BALANCE APPARENT IN WATER RIGHT PERMIT TERMS AND CONDITIONS AND IN CONDITIONS THAT

APPLY TO DISCHARGES OF WASTES TO CALIFORNIA WATERS. BUT HAVING SET THOSE TERMS AND CONDITIONS, WE LEAVE IT TO THE PERMITTEES TO DECIDE HOW BEST TO SATISFY THOSE CONDITIONS.

WE ARE PARTICULARLY RELUCTANT IN THIS CONTEXT BECAUSE MANY PARTIES BELIEVED THAT A DRAFT WATER QUALITY CONTROL PLAN THAT WE ISSUED FOR THE BAY AND DELTA WOULD HAVE TURNED THE STATE BOARD INTO AN OPERATIONAL AGENCY, WHICH WE CLEARLY ARE NOT.

THANK YOU FOR THE OPPORTUNITY TO TESTIFY ON THESE ISSUES.

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Senator **Bradley**. Mr. Kennedy.

STATEMENT OF DAVID N. KENNEDY, DIRECTOR, CALIFORNIA DEPARTMENT OF WATER RESOURCES

Mr. **Kennedy**. Thank you. Good morning, Mr. Chairman, Mr. Fazio. I have a written statement that I have submitted for the record. In the interests of your request for brevity, I'd like to just make some general comments about how we see the situation.

Senator **Bradley**. Your full statement will be printed in the record.

Mr. **Kennedy**. Thank you. The general problem we have in California is how to share the water resources we have in a way that meets the needs for irrigation and urban people, and at the same time protects the public trust values that we have. In recent years, there is more and more concern about the public trust values, and as you are going to hear much more of, there's a lot of going back and looking at what was done earlier, and seeing how we might correct some of the earlier problems that have occurred.

I think it's fair to say that more and more, we are trying to approach this multitude of problems through negotiation, rather than just through confrontation. We have spent a great number of years in the State, here in this building, confronting one another; we've pretty much concluded that not too much is solved that way. And so in recent years we have opened up negotiations on a lot of different issues. Possibly the most prominent is the coordinated operations agreement between our Department and the Bureau on the two projects that were approved by the Congress, Mr. Miller's bill, about three years ago.

I think that has illustrated to all of us that if we have the patience to sit down and work with one another, we can work our way through some of these very difficult problems.

Certainly the Bureau has to be a key player in many of the water issues in the State, particularly those in the Central Valley. So much of our water in California comes out of the Central Valley that the Bureau is involved in almost everything.

As we look at how they can participate, I basically can break it down into three things. First of all, they need a constructive attitude. And I think they have that at the present time. Certainly in years gone by, they had much more of a single-minded attitude towards irrigation and urban water supplies. Frankly, I have a difficult time faulting them for that, because that was the mission that most people saw at that time, and I think that they felt that they were fulfilling the mission that the Congress had given them in those years.

But clearly things have changed. Today there is a much different attitude among the people, and I believe that the Bureau's attitude has changed significantly also. Certainly we have a high degree of cooperation with the Bureau, they are participating in most of the negotiations that we are, and I think they're on the right track. But that's really not enough. In order to participate actively, they have to have the staff capability. These problems cannot obviously be solved through press releases and that type of thing.

You need staff expertise and people with the time to attend endless meetings. I wish there was another way to do it, but we've found that you just have to take the problem and work through all the endless details in order to find the common ground, the accommodation that we're all looking for.

And in that area, I think the Bureau is struggling somewhat. They've had a reduction during the mid-80's, they've lost a lot of good people, they've still got some very fine expertise. But frankly, we support their efforts to rebuild the staff capability to enable them to participate in the solution of these problems.

The third ingredient is of course a follow through, once we've completed negotiations, almost all of these efforts require spending money and doing something differently than we've done.

There are very few of these agreements that people simply agree to do something differently, operate something differently. So we do have to spend money. That's certainly one place that the Congress will have to get involved in in a major way, but we don't think it's entirely a Federal problem. We feel that the State is prepared to put up its appropriate share of the financial obligations that are necessary to solve these problems.

I think an illustration is on the Trinity River, where over a number of years, a lot of different folks put together a restoration program for the fisheries on the Trinity. This was put into a bill ultimately by Congressman Bosco, and I think most people feel that the program is having good success.

On the Sacramento River, we're some years behind, but a similar effort is now coming together. The State has just released a report that is the result of a task force approach over about 18 months, with a lot of different interests sitting down in a room week after week, I think we had two meetings a month for a long time, and finally came up with a consensus report that sets forth the program for restoration of the Sacramento River fisheries, Upper Sacramento River fisheries, and addresses to some extent the riparian habitat issue on the Sacramento River.

Again, Congressman Bosco has a bill being drafted, we hope to all work together on this in a non-partisan way, a lot of diverse interests. You find people participating in these that have little else in common, other than a desire to try and address these particular issues. So as that bill comes forward, we will again be looking to the Congress for support on that.

Our hope is to get these issues worked out here in California, and then bring them back to you in a pretty good state of harmony. That hasn't always been the case, but we'd like to resolve the controversies here, before they get back to Washington.

Mr. Chairman, I appreciate the opportunity to share those comments with you, and I'd be happy to deal with any questions that you'd have.

[The prepared statement of Mr. Kennedy follows:]

STATEMENT OF CALIFORNIA DEPARTMENT OF WATER RESOURCES BEFORE THE UNITED STATES SENATE SUBCOMMITTEE ON WATER AND POWER, SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

August 29, 1989

Thank you for the opportunity to appear before your committee today and share the views of the Department on federal water policy. We understand the oversight function which your committee exercises over Bureau of Reclamation activities and we appreciate your taking the time to hold this hearing in California.

The Bureau of Reclamation has played an extremely significant role in California water development for many years. It is fair to say the Bureau's projects have had a major influence on the economic growth and vitality of the State. As the Bureau itself has recognized, however, changing times require changing policies and approaches and it is appropriate to evaluate where we all are in the process.

I will respond briefly to each of the three questions provided in your hearing notice and I will be happy to provide any additional comments or information you would find helpful.

Question 1: "How should the Bureau implement its new mission in California?"

We see the Bureau's new mission with respect to California water issues as falling into four major areas:

(1) Construction of physical facilities which will reduce environmental impacts of existing projects, such as the proposed Temperature Control Device at Shasta Dam, modification of the fish passage facilities at Red Bluff Diversion Dam and the Buckhorn Debris Control Dam in the Trinity River Basin, currently under construction.

(2) Expansion of the Bureau's agricultural water conservation services to include extensive on-farm assistance to farmers and irrigation managers.

(3) Drainage management activities which recognize that emerging drainage problems, particularly on the west side of the San Joaquin Valley, will require diverse measures and considerable scientific expertise.

Presented by David Kennedy, Director, Department of Water Resources. Hearing conducted by Senator Bill Bradley at Sacramento in the State Capitol.

(4) Negotiation of new operational approaches to more effectively coordinate releases from existing reservoirs, to mitigate for fish and wildlife impacts, to adjust pumping schedules at diversion facilities and increase conjunctive operation of surface supplies with ground water basins.

The Bureau has been moving in these directions in the last few years and we believe the Bureau's staff should be commended for the considerable progress that has been made. I'm sure they would agree, however, that more can be done in each area to make operation of the entire water system more efficient and to lessen adverse environmental impacts.

An essential ingredient in fulfillment of these objectives will be to preserve and even enhance the Bureau's staff capability. The Bureau has many fine people across the spectrum of disciplines necessary to effectively participate in these types of activities. We should candidly recognize, however, that normal attrition and an uncertain program in the mid-1980's have taken their toll. We strongly support the Bureau's efforts to rebuild its staff with the engineers, biologists, attorneys and other disciplines that are needed for comprehensive water resources management. As a practical matter, there is no way the Bureau can participate in these activities without the necessary staff.

I would like to place particular emphasis on the need for the Bureau to develop more staff capability in the areas of water use efficiency and drainage management. Most people following California water issues believe that increased irrigation efficiency must be achieved. There is probably less consensus with our view that much irrigation water use in California is already at a relatively high level of efficiency. In most cases, improvements will be made on the margin, rather than with dramatic technical breakthroughs, and the greatest progress will be made on individual farms and with individual irrigation managers. The Bureau has the institutional expertise to work on these issues but relatively few people actually in the field. We therefore believe there is an opportunity to significantly expand the staff assigned to on-farm irrigation assistance.

Question 2: "What opportunities exist for mutually beneficial cooperation between California's environmental and water development interests that have not been fully taken advantage of?"

Probably the most significant environmental impacts of water development in California concern fish and wildlife resources. We believe the Bureau has made a good start in the last few years to address long-standing concerns of fish and wildlife interests. For instance, the Federal-State cooperative program on the Trinity River authorized a few years ago is making good progress not only with respect to water project impacts but also in dealing with impacts of the logging industry.

Similarly, a proposed fisheries restoration program for the Upper Sacramento River has just been published by the State. It was developed by a broad-based task force which included local, State and federal representatives. Congressman Bosco is now working with members of the task force to draft federal legislation which would help implement the program. The Bureau is, of course, a key player in Sacramento River fisheries issues.

Another long-standing fisheries issue which the Bureau is starting to address concerns the San Joaquin River. While there have been interagency discussions about restoration efforts for a couple of years, the Friant Unit contract renewal controversy this past spring has brought this issue to the forefront. We support the Secretary of Interior's recent direction to the Bureau to undertake a comprehensive environmental restoration program in the San Joaquin River stream system. Of necessity, the program will have to include local, State and federal agencies and concerned interest groups and will have to deal not only with fisheries and wildlife but with channel capacity for flood control and other related needs. Meetings are now being held to discuss an appropriate forum and institutional framework for addressing the San Joaquin River environmental issues.

One other environmental issue to which the Bureau is devoting more attention is providing water for wetlands. I'm sure that other speakers today will discuss this in more detail, but suffice it to say, allocation of the CVP's remaining water supply should include appropriate provision for the Central Valley's wetland areas.

Question 3: "How might the Bureau foster mutually beneficial cooperation between California's environmental and water development interests?"

The main thing the Bureau can do is to participate actively in the various negotiations that are addressing these issues. Because of the complexities and interrelationships of California water issues, there is very little the Bureau can do unilaterally. More and more we are trying to deal with water issues through negotiation and accommodation. We welcome and encourage the Bureau's participation in this process.

I would like to close my comments with the observation that there has been a high degree of cooperation between the Bureau and the State in recent years.

The Coordinated Operations Agreement is working well and we are now in design on a new facility where the project operation centers for the State and federal projects will both be located. In addition, we are making good progress in the negotiations for the "wheeling-purchase contract" provided for by Article 10(h) of the COA.

Mr. Chairman, that concludes my statement today. I would be happy to address whatever questions you might have.

Senator BRADLEY. Mr. Bontadelli.

STATEMENT OF PETER BONTADELLI, DIRECTOR, CALIFORNIA DEPARTMENT OF FISH AND GAME

Mr. BONTADELLI. Mr. Chairman, Congressman, I welcome the opportunity to appear before you today to present the Department of Fish and Game's views on improving the Federal water policies to help resolve California's water resource controversies. The subject is vital to our Department, as past Federal water policies have been a major cause of the degradation of California's fish and wildlife resources.

To cite just two examples, the Federal water project within the last 50 years has virtually eliminated the chinook salmon from the mainstem of the San Joaquin River, which once supported one of the State's largest runs, and has contributed to the striped bass decline in the Sacramento/San Joaquin Estuary. It is not, however, as everyone knows, by any manner or means the sole problem to striped bass.

Clearly, changes in Federal policy are essential. The Committee's questions have highlighted the fact that the Bureau of Reclamation has recently stated an intent to adopt a new mission based on environmentally sensitive resource management. Before providing the requested specific examples as to how the Bureau should implement that mission, I want to point out that California has been fortunate, in that the Bureau has been generally moving toward that mission in California for the last several years.

Two specific examples which should serve as models for the new Bureau are, one, the agreement for the preservation of the Suisun Marsh executed by the Bureau, the Department of Fish and Game, the Department of Water Resources and the Suisun Resources Conservation District in 1987. That culminated 20 years of planning to find a practical means to offset adverse water development impacts to waterfowl in a 55,000 acre brackish wetland, the largest such wetland remaining in the United States. Implementation of that agreement is well underway.

The Bureau and the Department have executed an agreement on flows for salmon in the Stanislaus River below New Melones Reservoir. The Bureau had essentially stonewalled the Department from 1972, when a need for better flows became apparent, until 1988. When the decision was made on the part of the Bureau to resolve the issue, we were able to reach agreement within six months.

While good things have happened, substantial problems remain, and I welcome the opportunity to provide some specifics on how the rhetoric of the new Bureau can be converted into action.

Let me start with a list of things that are already set for immediate implementation if they have appropriate authorization and appropriation.

The first is temperature control structure for Shasta Reservoir. This is essential, not only for the winter runs of salmon, but for all runs of salmon. Design is well underway and a specific facility needs to be authorized and constructed.

Second, Spring Creek. Mining pollution in Spring Creek is often lethal for salmon in the Sacramento River below Keswick Dam.

This is on the EPA Superfund list and the Bureau is carrying out the work. Allocation of EPA funds is essential and the Bureau needs to commit to providing dilution flows on those infrequent occasions when it may still be necessary, even after the Superfund project has been completed.

Third, Red Bluff Diversion Dam passage. This dam hinders the passage of all salmon runs. The Fish and Wildlife Service has recommended a concept for a new ladder. The Bureau has been in the process of reviewing and evaluating the engineering feasibility for approximately a year. This is a concept that needs to be taken to action and implementation. Again, if questions of authority remain, they need to be resolved, and clearly appropriation needs to be considered.

Waterfowl and wildlife refuges. Planning has been underway for years, and the need is specifically recognized in HR3113, the authorizing bill for the coordinated operations agreement. The need has also been recognized as part of the Central Valley Habitat Joint Venture, an element of the North American Waterfowl Management Plan that is currently being carried out by both the United States and Canada. In March of 1989, the Bureau completed a planning report entitled "Central Valley Refuge Water Supply Investigation." It is time to get on with the implementation of that report.

Modernization of both Coleman and Nimbus Hatcheries. These salmon mitigation hatcheries were completed 35 and 45 years ago. Modernization plans are available and need to be implemented.

Fish protection at the Tracy Pumping Plant. Within the last five years, the two other largest diverters from the Delta, the Department of Water Resources and the Pacific Gas and Electric Company, have upgraded their facilities to minimize losses to fish and implemented mitigation programs to offset unavoidable fish losses.

The Bureau has been conspicuous in its inability to come to conclusion on this issue to date. We are, however, now in serious negotiations over this obligation. There is no reason, in my estimation, why these negotiations cannot be completed in the reasonably foreseeable future.

Now I'd like to turn to a list for which implementation will be a little further away.

Gravel restoration below Keswick. The Shasta Reservoir cut off the gravel supply for the area of the Sacramento, and spawning gravels have been seriously depleted. A conceptual restoration plan exists and about $700,000 is now needed to prepare the implementation plans. While the plans are being implemented, the State is preparing to implement a pilot project which would accomplish about a tenth of the work.

The Trinity River. The ongoing 12-year study to determine flows needed to return the salmon in the Trinity and steelhead runs to pre-project levels, and the accompanying 10-year fish and wildlife habitat restoration program in the basin are both approaching the 50 percent completion points.

These two programs must be carried to completion if hope of restoring the Trinity system's viable fish and wildlife resources are to be realized. When the flow study is completed, the Bureau needs to be prepared to make a permanent commitment to providing the flows that are demonstrated to be necessary.

The Tehama Colusa Fish Facility. This facility was part of the Red Bluff Diversion Dam Program, and was an essential feature in the economic justification for that program. The facility's goal was to support 37,000 fish. It has never worked, and in our estimation it should be abandoned and the production goal met elsewhere, probably in part through a new salmon hatchery in the Keswick Dam area. In addition, the program's goals for another 20,000 fish for Story and Thomas Creeks need to be met.

I'd like to end the list of challenges for the new Bureau with two items that are even further away, but for which efforts are either now just beginning or need to be accelerated.

One is the restoration of the San Joaquin salmon runs. The Bureau has announced its intention to initiate a San Joaquin River recovery program, and this is most welcome. The effort needs to be funded, and given the mission of preparing an overall restoration plan within the next three years. Hopefully, some of the features which are identified can be implemented while planning is still in progress. The participation of a significant number of local water agencies is also essential if this effort is to be brought to a successful completion.

Delta waster diversion impacts. The current operations of the CVP and the State Water Project are having a major impact on fisheries resources in the Sacramento-San Joaquin Estuary. The solution involves changes in operations by both projects and construction of more facilities compatible with fishery resource management. This has proved to be one of California's most complicated social problems, due to an interrelationship of issues, issues which affect the vital interests of many diverse groups. The Bureau has recently become a full partner with ourselves and the Department of Water Resources in negotiations to attempt to resolve this problem. We need to ensure and create a commitment to resolve the problem through some combination of negotiations and the Water Resources Control Board's Bay-Delta hearing process. The commitment of many parties beyond our agencies is essential if this is to be brought to success.

Many of the initiatives I have described will require authorizing legislation, such as the Suisun Marsh protection did. We consider that on an individual basis is an appropriate way to go. If the Senate or the House chose, on the other hand, to look at a more general authorization, that would also be an acceptable direction.

All of our proposals pertain to adverse consequences of earlier Federal water development. We have done our share of castigating the Bureau and their traditional supporters for that development. I would propose that it is now time to move forward. I think it is appropriate to recognize that society as a whole was responsible for those past policies and that society is now demanding a change.

Accordingly, I think it is appropriate to stop assessing blame and to concentrate on what we all know needs to be done to restore fish and wildlife within the context of other competing needs.

A major share of the cost will have to be assigned to Federal water users; power beneficiaries should also share. Hence, it is absolutely essential that the Western Area Power Administration become an active participant. Many of the interrelationships of water delivery and timing have a direct influence on power, and how we need to reconcile it.

The State is providing some non-water project funding for Suisun Marsh restoration, and I hope that the State will be able to fund in the future a portion of the overall program.

An important practical problem is assuring that the Bureau has adequate staffing appropriately committed and trained to implement their new mission. We have been encountering circumstances where the Bureau now lacks the staff to do the things to which they are currently committed. In addition, the Bureau's staff expertise would be extremely helpful in resolving and finding solutions to fish and wildlife problems that are not directly associated with Bureau projects.

For example, we would welcome the Bureau's technical assistance in developing groundwater supplies for fish and wildlife purposes on Fish and Game lands, or in finding conjunctive use solutions with local water districts.

In summary, we welcome the Bureau's new mission. We have received increasing cooperation from the Bureau during the last decade, yet much remains to be done. I urge the Committee to provide the support necessary to implement many of the measures that I've outlined.

[The prepared statement of Mr. Bontadelli follows:]

FEDERAL WATER POLICIES IN RELATION TO FISH AND WILDLIFE RESOURCES IN CALIFORNIA[1]

I welcome the opportunity to appear before you today to present the Department of Fish and Game's views on improving federal water policies to help resolve California's water resource controversies. The subject is vital to our Department as past federal water policies have been a major cause of the degradation of California's fish and wildlife resources. To name just two of the many examples of such degradation, federal water development within the last 50 years has eliminated chinook salmon from the main San Joaquin River, which had supported one of the State's largest runs, and contributed to the striped bass population in the Sacramento-San Joaquin Estuary's being reduced to about a quarter of its former size. Clearly, changes in federal policy are essential.

The Committee's questions to us highlight the fact that the Bureau of Reclamation has recently stated an intent to adopt a new mission based on "environmentally sensitive resource management". Before providing the requested specific examples as to how the Bureau should implement that mission, I want to point out that we in California have been fortunate in that the Bureau has been

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1/ Presented to the Senate Energy and Natural Resources Committee by Peter Bontadelli, Director, California Department of Fish and Game, August 29, 1989.

gradually moving towards that mission in California for a number of years. Two specific examples which should serve as models for the "New Bureau" are:

1. The agreement on the preservation of Suisun Marsh executed by the Bureau, ourselves, the Department of Water Resources and the Suisun Resources Conservation District in 1987. That culminated 20 years of planning to find a practical means to offset adverse water development impacts on waterfowl in a 55,000 acre brackish wetland. Implementation of the agreement is well underway.
2. The Bureau and we executed an agreement for better flows for salmon in the Stanislaus River below New Melones Reservoir. The Bureau had basically stone-walled us from 1972, when the need for better flows became apparent, until 1988 when they indicated a desire to resolve the issue, and we were able to reach agreement within six months.

While good things have happened, substantial problems remain, and I welcome the opportunity to provide specific examples as to how the rhetoric of the "New Bureau" should be converted to action.

Let me start with a list of things which are ready for immediate implementation:

1. **Temperature Control Structure for Shasta Reservoir** - This is essential not only for the winter run of salmon but for all runs. Design is well underway and a specific facility needs to be authorized and constructed.

2. **Spring Creek** - Mining pollution in Spring Creek is often lethal for salmon in the Sacramento River below Keswick Dam. This is on EPA's Superfund list and the Bureau is carrying out the work. Allocation of EPA funds is essential and the Bureau needs to commit to providing dilution flows on the infrequent occasions when that will still be necessary after the Superfund project is completed.
3. **Red Bluff Diversion Dam Passage** - The dam hinders the passage of all salmon runs. The Fish and Wildlife Service has recommended a concept for a new fish ladder. The Bureau has had a year to evaluate the engineering feasibility of the concept and needs to get on with implementation.
4. **Water for Waterfowl Refuges** - Planning has been underway for years and the need is specifically recognized in HR3113, the authorizing bill for the Coordinated Operations Agreement. The need has also been recognized as part of the Central Valley Habitat Joint Venture, an element of the North American Waterfowl Management Plan being carried out jointly by the United States and Canada. In March 1989, the Bureau completed a planning report entitled "Central Valley Refuge Water Supply Investigation". It is time to get on with implementation.
5. **Modernization of Coleman and Nimbus Hatcheries** - These salmon mitigation hatcheries were completed 35 to 45 years ago. Modernization plans are available and need to be funded.
6. **Fish Protection at the Tracy Pumping Plant** -Within the last 5 years the two other largest water diverters from the Delta,

the State Water Project and Pacific Gas and Electric Company, have upgraded their facilities to minimize losses of fish and implemented mitigation programs to offset unavoidable fish losses. The Bureau has been conspicuous for its unwillingness to do likewise. They are now seriously negotiating with us over this obligation. There is no reason why the negotiations can not be completed by the end of the year.

Now I would like to turn to a list for which implementation is a little further away.

1. **Gravel Restoration Below Keswick Dam** - Shasta Reservoir cut off the gravel supply for this area and salmon spawning gravels are seriously depleted. A conceptual restoration plan exists and about $700,000 is needed to prepare an implementation plan. Meanwhile, the State is preparing to implement a pilot project which would accomplish about a tenth of the work.
2. **Trinity River** - The ongoing 12-year study to determine flows needed to return Trinity salmon and steelhead runs to pre-Trinity Project levels, and the accompanying 10-year fish and wildlife habitat restoration program in the basin authorized by U.S. Public Law 98-541, are both approaching 50%-completion points. These two important programs must be carried to completion if hope of restoring the Trinity system's valuable fish and wildlife resources to pre-dam

condition are to be realized. When the flow study is completed, the Bureau needs to make a permanent commitment to providing the flows shown to be necessary.

3. **Tehama Colusa Fish Facility** - This facility was part of the Red Bluff Diversion Dam program and was an essential feature for the economic justification for the program. The facility's goal is to support a run of 37,000 fish. It has never worked and should be abandoned and the production goal met elsewhere, probably in part by a new salmon hatchery at Keswick Dam. In addition, the program's goal of producing 20,000 fish in Stormy and Thomes creeks needs to be met.

I would like to end this list of challenges for the "New Bureau" with two items that are further away from solution.

1. **Restoration of San Joaquin Salmon Runs** - The unmitigated destruction of the salmon run in the San Joaquin River by Friant Dam is the greatest example of how far past federal water practices diverge from the public's current expectations for environmental protection. The Bureau's announced intention to initiate a San Joaquin River Recovery Program is most welcome. That effort needs to be funded and given the mission of preparing an overall restoration plan within three years. Hopefully, some features can be implemented while planning is in progress. The participation of local water agencies is essential to this effort.
2. **Delta Water Diverison Impacts** - The current operations of the Central Valley Project and the State Water Project are having

a major negative effect on fishery resources in the Sacramento-San Joaquin Estuary. The solution involves changes in operations by both projects and construction of facilities more compatible with fishery resource management. This has proved to be one of California's most complicated social problems due to an interrelationship of issues, issues affecting the vital interests of diverse groups. The Bureau has recently become a full partner with ourselves and the Department of Water Resources in negotiations to resolve the problem. We need to create the commitment to resolve the problem through some combination of those negotiations and the State Water Resources Control Board's Bay-Delta hearing process. The commitment of many parties beyond our agencies is necessary if the effort is to be successful.

Many of the initiatives I have described will require specific authorizing legislation as Suisun Marsh protection did. We consider that an acceptable way to go.

All of our proposals pertain to adverse consequences of earlier federal water development. We have done our share of castigating the Bureau and their traditional supporters for that development. I am moving forward now, however, and I think it is appropriate to recognize that society as a whole was responsible for those policies and that society now is demanding a change. Accordingly, I think it appropriate to stop assessing blame and to concentrate on what we all need to do to restore fish and wildlife.

A major share of the cost should be assigned to federal water users and power beneficiaries should also share. Hence, it is essential that the Western Area Power Administration participate. The State is providing some non-water project funding for Suisun Marsh restoration, and I expect it to fund a portion of the future overall program.

An important practical problem is assuring that the Bureau has adequate staffing for their new mission. We have been encountering circumstances where the Bureau lacks staff to do things. In addition, the Bureau's staff expertise could be helpful in solving fish and wildlife problems not directly associated with Bureau projects. For example, we would welcome the Bureau's technical assistance in developing ground water supplies for fish and wildlife purposes on Fish and Game owned lands.

In summary, I welcome the Bureau's new mission. We have received increasing cooperation from the Bureau during the last decade, yet much remains to be done. I urge your committee to provide the support necessary to implement the measures I have outlined.

Senator **Bradley**. Thank you very much, Mr. Bontadelli.

What I'd like to do is now ask questions. If any one of you disagree with what the other person has said, please raise your hand and immediately I will recognize you.

I would encourage disagreement on nuances as well as fundamentals, if you're so inclined.

Mr. Maughan, could you tell me, what do you see as the Bureau's obligations in meeting the State water quality standards as it relates to the Bay and Delta? I took it from your testimony that you thought the Bureau was totally subject to State water quality standards, pursuant to various court decisions. Is that correct?

Mr. **Maughan**. That's correct. We try to carry out the Federal mandate in the Clean Water Act, and we work through EPA on that score, too. So I think the State law and the Federal laws are combined in our actions.

Senator **Bradley**. So you see them as, whatever the State decides on this matter, they have to conform, basically.

Mr. **Maughan**. That's our view, yes.

Senator **Bradley**. Do you see anything in State law that precludes the Bureau from making a direct allocation of CVP water for instream uses? Is there anything in State law that prevents that?

Mr. **Maughan**. Well, our State law does not actually directly recognize an appropriation for instream uses, but under the public trust doctrine, which is a broader scope thing, we invariably in our water right decisions allow certain minimum flows for streams for fish purposes. So my general answer is, I think it would be very good if they did it as the chairman

Senator **Bradley**. But there is nothing specifically in State law that precludes it.

Mr. **Maughan**. No.

Senator **Bradley**. All right. In terms of the Bay-Delta water quality needs, what kind of technical information would be helpful in determining Bay and Delta water quality needs?

Mr. **Maughan**. Well, we held a very long series of hearings in 1987, and I think the information that was the least supportive was the biological information. We know that the striped bass indexes have gone way down, we know that in the Bay there have been changes in the biological stratum that's there. But we were unable to find out what the cause and effect was on some of these things, and that's where I think we need more information.

Senator **Bradley**. On cause and effect on the biological impacts?

Mr. **Maughan**. Yes.

Senator **Bradley**. Do you see anything the Federal Government could do to help in developing that information?

Mr. **Maughan**. Well, the Bureau has participated with the California agencies in funding Fish and Game to try to determine some of these things. The USGS is also working on the hydrodynamic model for the Bay. All of these things are coming along very slow, and they seem to produce sometimes conflicting evidence. The answer is, we like their support, if it could be extended, we would like that, because we need to find some of the answers a little quicker than it seems to be coming forth.

Senator **Bradley**. But basically you see no serious gap in the data.

Mr. **Maughan**. Well, as I say, only in the biological data. I think in terms of flow and salinity, and other hard data like that, I don't see any gaps there.

Senator **Bradley**. What about contaminant flow and contaminant transport in the Delta?

Mr. **Maughan**. Well, now we're dealing with such small quantities, it's only been in very recent years that they've been measurable. We do have all the point discharges pretty well monitored. We don't have all the non-point, and therefore, there are some areas there, particularly in the toxicants, the accumulation in biota that also needs to be worked on.

Senator **Bradley**. Do you have any specific suggestions there, as to what the Federal Government could do to help? Could EPA be helpful there?

Mr. **Maughan**. They could be, and they have been. And there has been a recent law passed and signed by the Governor that is going to provide the State some additional funds to do just exactly what you're talking about. We certainly could use more Federal funds in this area, too.

Senator **Bradley**. Can USGS be helpful?

Mr. **Maughan**. Yes, and they are helpful.

Senator **Bradley**. What should they be doing that they're not doing?

Mr. **Maughan**. Well, they're working on this hydrodynamic model, three-dimensional model, and I was just briefed the other day. My concern is, that it started out to be a fairly short project, now it's turned into one that's been three times as long. And quite honestly, I'm——

Senator **Bradley**. You're surprised, Mr. Maughan?

Mr. **Maughan**. No, I'm not. [General laughter.]

Mr. **Maughan**. And I think that the scientists, and I'll say this very frankly from long observation, they get wrapped up in some of the things that they want to perfect, but they don't necessarily provide the information needed for a policy decision, which I would hope that they could work along those lines better.

Senator **Bradley**. When will the Bay-Delta hearings be completed? Did I hear you say 1990?

Mr. **Maughan**. Well, I said the water quality control in 1990, I think our water rights decision for review will come out early in 1992.

Senator **Bradley**. Early 1992. Could you tell me, will the Westlands intertie have any impact on the resource at stake, or the options?

Mr. **Maughan**. Well, I've heard both sides to that.

Senator **Bradley**. What is that, it takes how much out of the Delta, about 125?

Mr. **Maughan**. Well, the Westlands intertie actually doesn't take necessarily too much more out of the Delta, it just means that——

Senator **Bradley**. Is that a debatable point?

Mr. **Maughan**. Well, maybe it is. They claim it would use the State pumping plant, because there's a constriction in the Federal canal system there. And therefore, the only way they can get the water they like to have would be to use the State pumps and then intertie it. I assume, since there is a restriction there, it would mean a little more water coming out of the Delta all right.

We would really prefer, speaking for the Board, to not move ahead on any of these major controversial areas unless there's an absolute emergency, until after we complete our Bay, Delta hearings. We have allowed some water transfers this year because of the drought, and we dealt with those independently, and I think we've done a good job with them and reached early decisions on them.

Senator **Bradley**. As you look at California's water problems, what role do you see marketing and water transfers playing, and what role do you see water conservation playing?

Mr. **Maughan**. I think they're extremely important roles. Senator, Mr. Chairman, I worked for the Bureau many years ago myself. I think the whole approach to western water problems has changed, and I don't think there are a lot of new major projects available, if any. I don't even think there are too many reservoir sites that can be developed that haven't already been developed.

So I think water conservation is the reasonable maximum degree, and I think there will be more water transfers taking place in the future than there ever has been in the past, to accommodate some growth and also to balance out a little bit more equitably the beneficial uses of the water supplies we have developed.

Senator **Bradley**. So you see them as primarily fostering a greater efficiency.

Mr. **Maughan**. Greater efficiency, allowing Mr. Bontadelli said, I think, the lawmakers and the public as a whole really look to some of these amenities that have been neglected for quite a while. And I think more water supply is needed for those purposes, and that's where it's going to come from.

Senator **Bradley**. Well, that kind of leads to Mr. Kennedy. Congressman Fazio, would you like to ask Mr. Maughan any questions, or do you want to wait until the end of the panel?

Mr. **Fazio**. Let's do that.

Senator **Bradley**. Mr. Maughan's point is that there will be greater demands and pressures, generating need for water transfer and marketing. Doesn't that go to what the projections are for the State's water use? What would you say? What are the State's projections for water use in agriculture, say, between now and 2010?

Mr. **Kennedy**. Our projections are that agriculture will be essentially level over the next 25 years.

Senator **Bradley**. So agriculture will use about how many acre feet then, per year?

Mr. **Kennedy**. About 26 million, 26 to 28. They're different numbers, but basically we believe that agriculture has leveled off more or less in California, recognizing that it goes up and down every year by a few hundred thousand acres, depending upon markets.

There will be shifting of crops over time, there will probably be a shifting from lower value to higher value crops. We already see that on the west side of the Valley where some of the cotton is coming out, and vegetables are going in.

Senator **Bradley**. So that you see cotton, barley, rice as endangered species?

Mr. KENNEDY. Oh, I don't think I'd——

[Laughter.]

Mr. KENNEDY. I would imagine we're always going to be growing those crops in California, but just as time goes on, there will be a gradual shifting over, as there has been in the past. The mix of crops that's grown here has just over time gradually gone to the higher value crops, and that will continue. But I think north of Sacramento, you're going to see rice grown for a lot of years to come.

Senator BRADLEY. But my question really is, that there are a few crops that consume a disproportionate amount of water and represent a very small portion of the total value of all crops that are sold, isn't that correct?

Mr. KENNEDY. Oh, I don't know that I'd put it in quite those stark terms.

Senator BRADLEY. Do you want the numbers?

Mr. KENNEDY. Well, there's numbers and there's numbers. I think that certainly there are instances in which that can be shown. But I don't know that as a generalization for instance, alfalfa uses a lot of water. But I think most of the alfalfa in this State is used to service the dairy industry. We consume a tremendous amount of dairy products in this State. If we weren't growing the alfalfa, we'd have to do something else to provide the dairy products. So I think we want to——

Senator BRADLEY. Right.

Mr. KENNEDY. Now, with respect to rice, we've been talking to the people in the Sacramento Valley about entering into arrangements to buy some of their water that's used for rice in very dry years. And there are some discussions going on that have some promise, and so I think there is an opportunity there, but I think where I'd put a slightly different emphasis than Mr. Maughan is that—and possibly just the way he answered your question, he didn't make this point.

We believe that there still is water development that needs to take place, and we have some programs underway to do that. We have a very large off-stream storage project on the west side of the San Joaquin Valley, well along in planning, the Los Banos Grandes project, about 1.7 million acre feet of storage. It has widespread support, it's been authorized by the Legislature.

We've got environmental problems with it, but we're continuing to go forward to try and deal with those problems.

Senator BRADLEY. So now again, on the projections, you see the agricultural use essentially flat at about 26 million.

Mr. KENNEDY. Twenty-six and a half, maybe something like that, 27.

Senator BRADLEY. Now, what do you see in terms of cities or industrial use?

Mr. KENNEDY. Over that period of time that you mentioned, there are probably going to be 10 million more people in the State, and we see that that's—and frankly, in contrast to a generation ago, I don't think there are many people that think that's a wonderful idea. People have quit running for public office in this State on a pro-growth platform.

Senator **Bradley**. Could I ask, would people who were not in California 25 years ago raise your hand in the hearing room.

[Hands raised.]

Senator **Bradley**. Let the record show that there were some. [General laughter.]

Mr. **Kennedy**. Maybe we could decide by lottery who's going to be leaving the State. But of the increase, we estimate about half will be born here and half will come here from somewhere else. So we feel the population increase is going to occur, there's going to be a need for an additional maybe million and a half acre feet of water over that period of time.

We estimate about half of that is going to be developed through greater efficiencies in water marketing, maybe half of that by development, Los Banos Grandes. And I think one thing that we're starting to discuss more, although I think water agencies have been thinking about it a long time, is greater use of our groundwater basins.

We have tremendous groundwater storage in this State, it's been used for many years, but we have the potential to expand the conjunctive use of our surface and groundwater basins. And I think that gives us an opportunity that we need to put more effort into.

Senator **Bradley**. What would you say the advantages are of the conjunctive use of ground and surface water, and could you give me some specific examples?

Mr. **Kennedy**. The advantages, I think basically are, it's economical in most cases, it is more environmentally benign than most water development. You basically have to take more surface water out of the system in normal and wet years, and then pump more groundwater in dry years. And among the alternatives, that's probably one of the most attractive we've got.

Senator **Bradley**. On the question of water transfers and water conservation, what role do you see those playing?

Mr. **Kennedy**. I think that water transfers will continue to play a role as they have for many years. We all in California cite the Owens Valley situation, where Los Angeles bought out those ranches in Owens Valley. The economists think it was a great idea, the rest of the State isn't quite so sure.

I'm sure that for Los Angeles, I think all things considered, it was the right thing to do, but it's made us all sensitive to the suggestion that we can simply solve these problems by buying out agriculture. I think it's going to happen on a case-by-case basis, where a lot of effort goes into protecting the third parties who would be impacted by these transfers. But nevertheless, they are going on, they went on this year, as Mr. Maughan indicated. We had a lot of struggles with the third party impacts this year, particularly the fisheries.

Senator **Bradley**. What could the Bureau do specifically to promote water marketing, greater water marketing, transfers, or/and greater water conservation? And try to be specific.

Mr. **Kennedy**. Well, let me deal with the water conservation because I didn't really answer that in your earlier question. We have gotten more and more involved in agricultural water conservation in the last five years, and we've come to realize that California agriculture right now is quite efficient. You could argue very efficient, but there are opportunities to increase that.

The opportunities are on the margin, though, they're going to take a lot of effort. It isn't going to happen just by some technological fix. So we feel that the Bureau needs to get the staff to work with the farmers on the farm. We've come to think that's really where ag conservation opportunities lie. Working with the individual farmers, and the irrigation managers, on each particular farm, with the unique characteristics of that farm.

So that's where we'd like to see the Bureau expand its staffing. We feel it has the expertise within the Bureau as an institution. We don't think it's got the people assigned to that, probably doesn't have the people on the staff right now, and we'd like to see them expand that.

Senator BRADLEY. Anything else on conservation, other than that?

Mr. KENNEDY. Well, I think you'll find, probably hear from other water people today that most water agencies in the State now are very proud of the conservation efforts. You find a lot of cooperation among various parts of the State. As a result of the State Board's hearings, there's a new effort underway to get the urban water people in the State to decide collectively what are the best management practices, what is the acceptable standard for urban conservation. And there's a lot of good discussion going on now among the urban agencies in the State on that.

Senator BRADLEY. So could I ask you, you've said you think that the future lays in using groundwater and surface water conjunctively.

Mr. KENNEDY. And expanding the conjunctive use.

Senator BRADLEY. And expanding.

Mr. KENNEDY. Right.

Senator BRADLEY. Now, how is that going to work in light of the problems related to agricultural drainage issues? Doesn't that put a real premium on trying to solve the agricultural drainage issues, so that your conjunctive use is really not frustrated by those problems?

Mr. KENNEDY. I'm sure there's a relationship, as there is with all these problems, but I think we have to solve the ag drainage problem almost irrespective. And the opportunities where we have to expand conjunctive use are generally speaking areas where we don't have agricultural drainage issues right now.

For instance, down in Kern County, our Department last year bought 20,000 acres of land in the Kern River Fan, where we are going to develop a groundwater storage program, we call it the Kern Water Bank. There is an opportunity to develop a pretty good storage program there.

Senator BRADLEY. Do you have anything, any views that you want to offer about the drainage issue?

Mr. KENNEDY. It's a tough one. I'm very much involved in it, and I'm chairman of the inter-agency program, Mr. Bontadelli and I and three other folks. We've spent a lot of Federal money, quite a bit of State money on this program, we've come to realize there's no single answer to it, there's no magic black box that's going to solve it. The place to begin solving it is in irrigation management, to use less water on the farm, and here again, we've got to get back to greater efficiencies.

But it's a mistake for us to go into it thinking that there's a lot of water being wasted there. We're really talking about fine tuning what's going on out there. Overall, you could use quite a bit less water on the west side than is being used. But it's going to take a number of years of working with the farmers in figuring out how to do that on each individual field. Now, there are other things we have to do in agricultural drainage, but we feel that's the place to begin.

Senator **Bradley**. Congressman Fazio?

Mr. **Fazio**. I might interject at this point, one of the real controversies we've had over the last year is on the concept of an EIS requirement on contract renewal. And of course, this was offered as a way of providing more incentive toward water conservation. The issue of whether that water was retained and used by the District or made available was also, of course, part of this debate.

Do you think, Dave, there's any utility in that approach to promotion of water conservation, or is there some variant on that bureaucratic scheme that might provide further incentive?

Mr. **Kennedy**. You mean on doing an EIS?

Mr. **Fazio**. Yes.

Mr. **Kennedy**. My personal view was that the EIS did not offer much opportunity to solve a problem. EIS's themselves are kind of a big exercise that people may or may not negotiate about. And I think it would make more sense to put aside the legal argument and just sit down with all of the parties and figure out what we need to do on the San Joaquin River. We and Fish and Game, Bureau of Reclamation, Fish and Wildlife, all of us have started that round of meetings, to try and figure out how we deal with this. It's more complex than the Sacramento River, there are more problems, more players, there are more issues. But it has to be done.

I think we're going to get there sooner if we can stay out of court, you know. The view that litigation is simply a difficult form of communication, I think it was never more true than on the San Joaquin River. So we'd like to put all that aside, and just get on with trying to figure out what is it we all need to do differently on the San Joaquin River to make this system operate better.

Mr. **Fazio**. And you don't think there's anything magic about a contract coming up for renewal. You think it ought to be done across the board with all of the districts, regardless of where they may be in their own personal history of participating?

Mr. **Kennedy**. Well, I am troubled by the notion of an EIR or an EIS at the Federal system for contract renewal for people who have had a contract for 40 years, have clearly come to depend on that for their economy. Basically the EIS says, maybe we're not going to renew this contract.

Now, my reading of the law, and Mr. Chairman, I'm an engineer, not an attorney, so you can take it in that context. But I have read it, and it just struck me that there was a law passed in the mid-50's that told these people they had a right to renew those contracts. And I was troubled by folks that came in and said, well, maybe yes and maybe no.

If this was done here in Sacramento, or if it was done to San Francisco—you know, San Francisco got pretty exited when Secretary Hodel talked about taking their dam out. People don't want what they consider their necessary water threatened. And I felt, if we get into one of these big jurisdictional legal hassles, it doesn't provide any more water for fish, we just spend more time arguing about things.

Mr. **Fazio**. How do we get to bring everybody together in each situation, as you say uniquely, different circumstances, different cropping patterns, a combination of irrigation and M&I uses. How do we get that all to the point where we can begin to practically work out these arrangements?

Mr. **Kennedy**. I think it is beginning. You basically invite people to come to meetings, you keep the door open, don't exclude anybody. And we've done it now in a number of cases, and I think that there actually is some confidence among both the water people and the environmental people that some of these issues have been successfully dealt with.

Mr. **Fazio**. There's no question the Bureau is on board in this regard.

Mr. **Kennedy**. I believe that Secretary Lujan has made it clear to the Bureau, and they have accepted his counsel very constructively. I've talked to Mr. Hancock about this a number of times, and I believe that we all share this desire to get on with the San Joaquin River restoration. We've had some meetings now, there are more meetings scheduled, the agencies felt they needed to get started, and so, so far we have not invited in the other interests.

But that clearly has to be done. The agencies can't solve these problems on their own. So I think during the fall you're going to start seeing some rather large meetings where people are invited in to share their views. And that is going to take a lot of technical discussion, how can we do things differently.

Senator **Bradley**. Do you think that the San Joaquin drainage program should be extended?

Mr. **Kennedy**. It's going to have to be extended in the sense that the problem is not going to be solved a year from now when the current program runs out. We're going to have to shift into another phase. We have collected a lot of valuable information. The USGS, I think we all feel has done an outstanding job in figuring out what happened, and how that system works down there.

Senator **Bradley**. How much do you think it should be extended?

Mr. **Kennedy**. In a sense, it's going to have to be extended in some form, as long as we've got the problem. The problem isn't going away next year.

Senator **Bradley**. So you see it as a permanent aspect of the solution?

Mr. **Kennedy**. I see the Bureau being permanently involved in this issue, yes.

Senator **Bradley**. Now, you say that you don't think that it's helpful at the point of contract renewal, to address things like an EIS, or increased efficiency or drainage management or conservation, or any of the other myriad issues. And as I take it, you think that it's best resolved by reasonable people sitting around a table and talking about the problem. Would you put a time limit on reasonable people arriving at an acceptable conclusion?

Mr. **Kennedy**. I wouldn't tend to put a time limit perse, because most of the instances I've seen in which that was done, it itself became a stumbling block. But I think that the elected officials need to keep a close watch on all the rest of us, and make your own judgments as to whether we're making progress.

Senator **Bradley**. One of the reasons we're here is to give you and Californians generally the opportunity to offer suggestions on this, because, you know, if you're in Washington, this is a very attractive thing to do, to link. And so what can you say for the record that the Committee might want to hear, as to whether the results can be accomplished a different way? That's basically what I'm asking.

Mr. **Kennedy**. Well, I think you can look at earlier problems and see whether similar groups of people were able to resolve them, and I think there's a pretty good record on some of these. The San Joaquin River is one of the toughest, and we're probably just getting started on it. So I think you're going to have to come back out here periodically and see, are we making progress or not?

Senator **Bradley**. Right.

Mr. **Kennedy**. If people are not making progress, I don't fault them at all for going to court. Sometimes that's the only way you can get somebody's attention.

Senator **Bradley**. Right.

Mr. **Kennedy**. But I think in this particular case, the Secretary certainly made it clear that you have his attention.

Senator **Bradley**. Under the Reclamation Reform Act of 1982, the sections that dealt with every district developing its own conservation plan, do you think we ought to put a requirement that those plans be implemented, not just that they have them?

Mr. **Kennedy**. I think that you should review where they are with that whole process. Under our reading of the law, the Bureau has the capability at any time to go in and take a look at how their contractors are using their water. And that's rarely been necessary, and it's usually a little difficult when they've gotten into it. On the Colorado River, they got into it some years ago, and had a pretty good controversy. But nobody has a right to use water unreasonably. The test of what's reasonable changes over time. The circumstances change.

Senator **Bradley**. Could you describe for the record, what is the State's agricultural water conservation program?

Mr. **Kennedy**. Our Department? We have an Office of Water Conservation that's very active, that works with districts throughout the State, both urban and ag conservation. We're frankly rather proud of the program. We get lots of inquiries from other states, we send people to share with them what we've learned, what works and what doesn't work. But we feel that the State, over the last decade, has made a lot of progress on water conservation.

Senator **Bradley**. Just give me your reaction, would the State accept transfer of the CVP to state control? [Laughter.]

Mr. **Kennedy**. I think I observed one time, that is one gift horse I would want to look at its teeth.

Senator **Bradley**. You don't want it.

Mr. **Kennedy**. I think it would probably be unnecessarily complicated. [General laughter.]

Mr. **Kennedy**. I think——

Senator **Bradley**. You'd better just stop there.

Mr. **Kennedy**. We and the Bureau are coordinating better, there are opportunities to increase the coordination, and I think that's a more promising approach.

Senator **Bradley**. Mr. Bontadelli, let me ask you, could new fishery diversion facilities in the Delta reduce the Federal pumping plant's impact on fisheries?

Mr. **Bontadelli**. There are always opportunities to improve the facilities in the area. How much we can improve them, at what cost, I think, would have to be looked at. The question of whether or not it's feasible to do any combining or significant changing will have real impacts overall on how the water is delivered. We probably need to look at some form of new facilities, but the cost factor, and whether it's at that location or a different location, are going to have to be reviewed. I don't think it's a short-term answer.

Senator **Bradley**. When are the winter chinook in the Delta?

Mr. **Bontadelli**. The out-migrants, which have the most significant impact, would tend to be there during the times when we have traditionally indicated it would be best to take more water. Basically November, December, through January, February period. So it creates a headache for us.

We're in the process now of attempting vis-a-vis the Yuba transfer to come up with a specific set of recommendations that would minimize any impacts for any water that's taken during those timeframes.

Senator **Bradley**. Will increased wintertime pumping adversely affect the chinook?

Mr. **Bontadelli**. It has a potential, if not correctly handled, and that's what we're attempting to find now are, what types of methods would work best, and that's what we are attempting to put in as part of the recommended measures for the Yuba contract transfers.

Senator **Bradley**. And when will they be ready?

Mr. **Bontadelli**. We are obligated to have them in place prior to the transfer of the water this winter.

Senator **Bradley**. This winter. So that your conclusions on this will be available this winter.

Mr. **Bontadelli**. Yes, they will, and we are consulting with both Fish and Wildlife Service, the National Marine Fishery Service on those conclusions.

Senator **Bradley**. Does State law require protection of fisheries below dams in California?

Mr. **Bontadelli**. 5937 of the Fish and Game Code has that requirement in it. The Supreme Court has ruled recently that an appellate court decision relative to Rush Creek, that that was an active section and a viable section that needed to be considered, and basically indicated that that needed to be reviewed by the Water Quality Control Board in setting and reviewing the public trust questions.

So there is a fundamental requirement in State law that the Court has now indicated must be used by the Water Board in the process of evaluating their decisions.

Senator **Bradley**. How has the Bureau contributed to the State efforts to protect fish and wildlife?

Mr. **Bontadelli**. I think the winter run provided some of the best examples of some of the things that they have done recently, as the awareness level has increased. They have raised the gates of Red Bluff Diversion Dam during the critical times for passage, they have agreed to significant foregone power production, which is one of the reasons I mentioned the need to keep Western Power involved. Much of the tradeoff that we're dealing with is not strictly water at this point.

In many instances, the water is not the fundamental issue, it is the loss of electrical power production and the modification of electrical contracts, which is actually more critical than the actual water uses. The water is actually a secondary issue in terms of the cost factors in meeting the fishery needs.

The Bureau has completed, as I indicated, the design work for the temperature curtain at Shasta, which would facilitate all runs including the winter run. They are in the process of installing significant new headworks at Tehama-Colusa, which will hopefully be a significant improvement from a fishery standpoint.

They have made a fundamental commitment to work with us in terms of attempting to get the funds to begin the modernization at Nimbus Hatchery. We have several programs along that line that are underway. The Bureau, I believe, has a basic commitment at the managerial level here in California to get the job done. I'm not sure that the appropriations and authorization at the Federal level pursuant to their solicitor's interpretations on occasion, keep pace with the current commitment of the personnel in the field.

Individually projects would need to be reviewed as the solutions are identified, and specific clarifying authorization may be needed. This is what we found with Suisun, you couldn't just do the implementation without coming back for clarifying the authorities under which they operated.

Senator **Bradley**. Does California Fish and Game have an opinion about what the Bureau should do with any unallocated CVP firm yield?

Mr. **Bontadelli**. We have a recommendation for some of the fish and wildlife needs that can be met. There are competing demands that will be made on that. And I think conjunctive use, and Mr. Kennedy indicated, might provide an answer to handle both aspects. If we can in fact utilize conjunctive use groundwater, particularly in dry years, to meet some of the needs for example of the refuges, with perhaps an input of federal power through the offset that's produced by the Bureau, then the amount of water that would need to be delivered over the surface would be significantly diminished.

If you take advantage of some of the existing Federal crop setaside programs, and some of the longer term setasides, and if there is a method of re-marketing or moving the water that is saved by that process, you can actually make up much of the loss that would otherwise be there from a water community standpoint, as fish and wildlife needs are met.

Most of the fish and wildlife needs in California can probably be met if a concerted statewide effort is made to look at overall conjunctive use and marketing, in combination.

Senator BRADLEY. So you're suggesting that certain lands that are now allocated water by the CVP for the growing of crops, would be taken out of production and the water reallocated for instream use or for wetlands or whatever, that the remaining water above that which was needed for the wetlands would then be marketed by the person holding the allocation?

Mr. BONTADELLI. That is an option which I think would provide an incentive, both to the individual and also meet the joint goals. And I wasn't specifically recommending taking them out, but as those lands which are currently taken out as a result of federal crop programs come out, or as an individual voluntary contract can be reached, in an area where duck benefits, for example, to meet the North American Waterfowl Plan goals, can be identified, then the ability to market water by the individual holding the water's current use, may be the final incentive needed to actually put it together that would provide the water both for fish and wildlife, and for the beneficial uses.

Senator BRADLEY. The Bureau did a study where they assessed need for water in wetlands.

Mr. BONTADELLI. State and Federal refuges, about 410,000 acre feet.

Senator BRADLEY. 410,000 acre feet?

Mr. BONTADELLI. Roughly in that neighborhood.

Senator BRADLEY. The number I had was 526,000 acre feet. But whatever. Is it also true that there are only about 380,000 acre feet made available, and secure supply only about 121,000 acre feet?

Mr. BONTADELLI. Those numbers are very close to accurate, if not exactly.

Senator BRADLEY. Well, so what do we do about the difference?

Mr. BONTADELLI. Most of the difference can be made up with a variety of relative firm yield contracts, looking at differentials between wet and dry years. There's a program that was set forth, which requires groundwater development for dry years, providing it under a series of contracts in wet and normal years, for surface deliveries.

I believe the total deficiency when you get down to it is less than 100,000 acre feet. If you look at all the options that were put together in that particular report, so it's a report that is in my estimation, highly do-able, it can be implemented.

And even though the total numbers are high, if you look at it from the total conjunctive use integrated standpoint that's recommended, the total impact is not significant on the overall supply that's available, while still meeting those needs.

Senator BRADLEY. I think every witness on the panel has said that the Bureau needs more adequate staffing. Each of you have indicated staffing in different areas. In order to deal with this issue, do you think it needs more adequate staffing in the area of your interest?

Mr. BONTADELLI. I would not disagree with that statement. I believe I made it earlier. Yes, there are some, and some of the same people who would work on individual farm sites, helping farmers find better uses of their water, would also be extremely useful to us in helping to find the conjunctive use solutions.

Senator BRADLEY. One last question. Does the WAPA power marketing policy have any effect on fish and wildlife?

Mr. BONTADELLI. In our view it does. I'm not sure of all the implications and intricacies of the Act, but we are concerned about it in many instances. And some of the ongoing fixed contracts also for power delivery have an impact.

Senator BRADLEY. Could you be any more specific?

Mr. BONTADELLI. We are concerned that some of the choice and decision to bring water over from the Trinity versus the Sacramento for the varying runs of salmon this year is driven more by the need to make power commitments and honor existing power contracts than by the best utilization of water from the standpoint of temperature and meeting those goals for fisheries.

The existing contracts from the power standpoint may make it impossible for the Bureau to make the best water use decisions from a temperature standpoint.

Senator BRADLEY. How is your viewpoint figured into that process?

Mr. BONTADELLI. In the past we have never been a party or reviewed the power contracts. And what I was trying to indicate is that the Bureau is not the only entity that needs to be involved from a Federal standpoint. The power impacts and interrelationship must be considered, and Western Power Administration must be brought in and have a similar mission to that of the Bureau, of providing the power, but in a manner that is appropriate.

I believe the tentative decisions made on the Glen Canyon Dam, which will impact power supply in much of Southern California, and any changes there are a clear example of the types of interrelationships that need to be reviewed, and will be studied through that EIS process in the Colorado River case.

Senator BRADLEY. Congressman Fazio?

Mr. FAZIO. Mr. Chairman, I just wanted to ask Peter if he would briefly outline for us what kind of authorities you would hope to be granted to you in the generic authorization you mentioned. I was the author of the Suisun Marsh authorization. You're saying, rather than go at it piecemeal, problem by problem, perhaps some sort of an overall piece of legislation could be enacted to provide for mitigation of prior problems, and involve Federal dollars in the solution of joint problems.

Could you outline for the Committee what you might be asking them in effect to do?

Mr. BONTADELLI. I believe I indicated there would be two acceptable choices. One is to take it project by project, as it comes up, where we can actually give you a definitive answer, such as we did on Suisun.

If there is a more generic decision, perhaps a blanket authority putting it on relatively even par, the ability to deal with the fish and wildlife needs and use of the Federal water with a relative priority would be something that needs to be observed.

But I am not advocating at this point a general authorization.

Mr. **Fazio**. Would you consider any proposals that are on the verge of being placed in the bill that you think would be well enough defined that Congress could enact them?

Mr. **Bontadelli**. At this point, I don't have a direct answer. I'll be glad to try to provide something to you on a few specific examples along those lines, Congressman.

Mr. **Fazio**. I'd appreciate that. And just to conclude, Dave, you mentioned in your statement that you felt that one of the Bureau's new missions was to construct physical facilities, which reduce environmental impacts on existing projects. I noticed you didn't have any new water development construction proposals included in those concepts that you thought the new Bureau should consider.

Is there any new water development that you think is the responsibility, or could the responsibility of the Bureau for production of new water resources in the State, for a variety of purposes, any one of them.

Mr. **Kennedy**. Well, the Bureau is a participant in our LosBanos Grandes investigation. And they have been interested in off-stream storage south of the Delta, so that's one that could conceivably turn out to be a partnership, although I think it's probably less likely at this point.

Certainly here in Sacramento you've got the longstanding Auburn issue that needs to be resolved. The Bureau has an authorized project, they've got a proposal. The Corps of Engineers 'studies are moving along, and as we mentioned to you yesterday, I think that the time is coming this winter to come to grips with that.

Certainly there are those in the Central Valley Project family who would like to see that go forward as a Bureau project.

Senator **Bradley**. Do you think this is the 63rd year?

Mr. **Kennedy**. Excuse me, Senator?

Senator **Bradley**. Do you think this is the 63rd year?

Mr. **Kennedy**. I don't think I heard——

Senator **Bradley**. The flood.

Mr. **Kennedy**. Oh, okay. I hope not. But we need to do something on flood control, and the Bureau has an authorized project, and I think that the time is coming this winter when we need to come to grips with just what happens here.

Mr. **Fazio**. But at this point it's not clear to you that we have a viable Federal project in the traditional sense. I mean, I really think

Mr. **Kennedy**. That's fair. Yeah, it isn't clear. There's just a lot of——

Mr. **Fazio**. Try to be a little more explicit if you would, what you think our options are.

Mr. **Kennedy**. On Auburn? The options basically are, in our judgment, there has to be flood control storage at the Auburn site. I think the studies have come far enough along that we believe you cannot provide adequate flood protection in this area without storage at that site. So then the options become, do you build a flood control dam, do you build flood control with the possibility of expanding to something more, or do you build a multiple purpose structure of some size.

And the Bureau has an authorized multiple purpose project with lots of problems, one of which is, it's very expensive. The environmental community is much concerned about Auburn. We just, over these coming months, we need to sit down and work our way through this one. It's gone on a long time, and in our view, the need for flood control in this area is so significant that we cannot afford to delay much longer.

Mr. **Fazio**. Would the State of California be interested in taking the responsibility for that project, if the Bureau weren't successful in obtaining Federal support, whether it be executive or legislative?

Mr. **Kennedy**. As a multiple purpose project, no. We looked at that a couple of years ago, and penciled it out. The State really can't justify it. I think if it's going to be a multiple purpose project, this community itself needs to look basically at future water and power. There's some water available for the rest of the Central Valley Project, it's quite expensive, depending on how you meld it, you know. People have got numbers that show that it's reasonable, other people question whether that's true.

And I think that my point is that the time has come to sit down with the groups and work our way through that one.

Mr. **Fazio**. I agree. I think the next year is very crucial. I appreciate your comments.

Senator **Bradley**. Mr. Maughan, one last question to you. You've listened quietly to the other two witnesses. Do you think the Bureau should proceed with its renewals and water marketing contracts before the Board completes its review of the Bay, Delta water quality needs?

Mr. **Maughan**. Well, we've sort of tried to stay out of that particular issue and have the——

Senator **Bradley**. That's why I asked you, Mr. Maughan.

[General laughter.]

Senator **Bradley**. I want your expert, experienced opinion.

Mr. **Maughan**. I'll give you my personal answer, I cannot speak for the State Board.

Senator **Bradley**. Yes, by all means. I want to hear your personal answer.

Mr. **Maughan**. As indicated, I think the San Joaquin has been misused in a sense. And I think it's time to reexamine that, and I think they could very easily sign contracts, maybe not for the full 40 years, but something less than that, to allow some full evaluation of what's going on.

I don't want to deprive them of any water they absolutely need, but there may be ways that——

Senator **Bradley**. You mean shorter contracts?

Mr. **Maughan**. Yes, shorter contracts.

Senator **Bradley**. Do you have a number in mind?

Mr. **Maughan**. Ten years. You know, the Hoover power contracts, after they expired after 50 years, they signed on a shorter basis than they did originally. And while the power contractors didn't particularly like that to begin with, I think they negotiated and they seem to be all satisfied now.

May I just add one other thing. I did the negotiations for development, and I have been around while all that has been going on. I think it's great. But I do believe that in permit terms, and in standards for objective numerals, are necessary to really bring these things fully in focus sometimes. So that everybody knows what the goal is. And I think that in terms of these negotiations, both in terms of time and in terms of what the final result is supposed to be, that if you leave it wide open, I think it's good up to a point, but then it sort of falls apart if it goes too long.

Senator BRADLEY. And so what are your suggestions as to how to——

Mr. MAUGHAN. I think that's the role the State Board has is setting standards in the Delta for certain water quality standards or discharge standards, and then the water rights. You don't take them away from anybody, but you give them in terms that specifically say what their share of meeting these requirements are.

Senator BRADLEY. Okay. Well, someone once said our job is not to fix blame for the past, but to set a course for the future. That was not Mr. Bontadelli, but that was John Kennedy. And each of you have contributed very much to the Committee's thought process about that future. Thank you very much for your testimony.

Our next panel is Hamilton Candee, senior project attorney, Natural Resource Defense Council, San Francisco; John Krautkraemer, senior attorney, Environmental Defense Fund; Nathaniel Bingham, president, Pacific Coast Federation of Fisherman's Associations; and Dan Chapin, vice president, California Waterfowl Association.

Let me welcome all four of you to the Subcommittee. I would urge you to limit your testimony to ten minutes. We are operating under some time constraints, so I will try to enforce that time limit. And also, we'd like to leave as much as we can for questions. I know that Congressman Fazio might want to ask a question or two, although you know him well for his experience and record.

[Pause.]

Senator BRADLEY. Well, let's begin if we can, have a little order in the room, give our witnesses the full attention that they deserve.

Why don't we begin with Mr. Candee, and then Mr. Krautkraemer, Mr. Bingham and Mr. Chapin. Mr. Candee, welcome to the Subcommittee.

STATEMENT OF HAMILTON CANDEE, SENIOR PROJECT ATTORNEY, NATURAL RESOURCES DEFENSE COUNCIL

Mr. CANDEE. Thank you very much, Mr. Chairman, Congressman Fazio. My name is Hamilton Candee, and I am a senior project attorney in the San Francisco office of the Natural Resources Defense Council. NRDC has worked for many years on promoting the conservation and rational use of western water resources.

In particular, NRDC's Western Water Project has worked on ending the contamination of Kesterson Wildlife Refuge, implementing the subsidy limits of reclamation law, strengthening water quality standards for the San Francisco Bay-Delta Estuary, and requiring an environmental impact statement on the CVP water contract renewals.

Mr. Chairman, I have a printed statement which is pretty long, so what I'm going to try to do is summarize it here today, but I'd like to have the written statement entered into the record, if that's all right.

Senator **Bradley**. Your full statement will be printed in the record.

Mr. **Candee**. Thank you. We commend you, Mr. Chairman, for holding these hearings on issues of critical importance to California's future. We welcome your Subcommittee's strong interest and hope that with increased Congressional oversight will come improved sensitivity by the Bureau of Reclamation to environmental concerns. We believe that the Federal Government certainly can play a more positive role in protecting the State's fish, wildlife, and other environmental resources.

The Bureau of Reclamation did not build its reputation on sensitivity to such issues. But in 1987, it announced its decision to turn the corner and change its mission. Unfortunately, many of the Bureau's current and planned activities fail to promote their new goals of efficient and environmentally sensitive management; indeed, they actively undermine these goals. For the next few minutes, I will discuss some of the sources of these problems and make recommendations for correcting them. One of the fundamental forces that shapes the California water system is the availability of Federal irrigation water at heavily subsidized rates. The Congressional budget office has pointed out that subsidies "blunt western farmers' incentives to conserve water and encourage cultivation of water-intensive crops, such as cotton or rice, in arid regions."

According to a California Department of Water Resources report:

> The market prices of CVP irrigation water have been so far below cost for a contract period of forty years that poor quality lands have been brought into irrigation production that otherwise likely would not have occurred.

Perhaps most importantly, subsidies increase the pressure for new projects, upstream diversions and additional exports from the Delta by protecting the water user from one of the most important mechanisms for regulating use—price.

Dams and other Bureau facilities, in turn, have caused serious deterioration of the State's fish and wildlife resources—blocking the downstream transport of gravel needed for fish spawning, diminishing flows needed for migration, altering water temperatures and water quality, and diverting flows necessary for the support of wetlands and waterfowl populations.

Such problems have been aggravated by the Bureau's failure to commit firm water supplies to refuges.

These examples illustrate the important link between fish declines, dry refuges, and the degradation of Delta water quality on the one hand and the lack of enforcement of Federal acreage and subsidy limitations on the other. This tension is heightened by the Bureau's recent decision to automatically renew all of its existing 40-year contracts throughout the Central Valley Project, rather than explore its various alternatives, including pricing alternatives and allocation alternatives.

We recognize that many farmers value the environment and take care to use water wisely. Nevertheless, when water costs are low, conservation investments may not make economic sense. Farmers who do value the environment may thus have an uphill battle, as long as the Bureau's pricing practices fail to provide any incentive to conserve.

There are several ways to remedy this situation. For example, some districts have instituted their own incentive systems by adopting a tiered pricing structure, in which the price of water rises rapidly for those whose water use per acre exceeds the district average.

Studies show that such systems encourage conservation with little influence on farm profits. But such practices have so far been adopted by very few districts.

A more far-reaching approach would be for the Bureau to eliminate its illegal subsidies altogether, and second, to incorporate the cost of drainage facilities and environmental mitigation into its new contracts.

We believe that one of the starting points for the Bureau in implementing its new mission should be a reexamination of its approach to implementing reclamation law, especially its pricing and acreage limitation practices.

The Reclamation Reform Act, as you know, offered an important handle for limiting subsidies and improving the overall efficiency of water use in the Central Valley Project and throughout the West.

Although the Act did expand the acreage limitation sixfold, and provide growers many other new benefits, it required in exchange a firm limit on subsidies and increases in water prices even for those below the acreage limitation.

Yet, contrary to Congressional intent, the Bureau approved regulations to implement that law that create loopholes in the acreage limitations. These loopholes allow farmers to continue to receive subsidies for farms well in excess of the 960-acre limitation.

I should point out that the difference between the subsidized price and the full cost price is very dramatic. For example, a lot of the contractors in California are still paying $3.50 an acre foot, whereas their full cost price might be in the range of $30 to $50 an acre foot.

And one can see if the subsidy limitation is not enforced, and everyone can avoid that full cost price, you have a very different effect on people's water use and the incentive to conserve.

The recent example of the Westhaven Trust created by the J.G. Boswell Co. vividly demonstrates the failures of the Bureau's acreage limitation rules. In fact, sometimes we wonder if people were trying to do us a favor by delivering this vivid example which I have, by the way, attached to the end of my testimony, an appendix which diagrams the Westhaven Trust. We received this from the Department of the Interior under the Freedom of Information Act.

Under this new Trust, the Boswell Co., which is one of the largest cotton operations in the world, has transformed its 23,000 acre Boston Ranch in the Westlands Water District into a new trust that benefits only the 250 or so salaried employees of the Boswell Co. Because employee's beneficial interest in the trust is proportional to the size of his or her salary and because Mr. Boswell apparently makes a much bigger salary than anyone, he gets the biggest share of the trust.

Moreover, the trustee, which is a bank of which Mr. Boswell serves as a director, according to the newspaper reports, has agreed to put the Boswell Co. back in charge of the farm, by hiring the Boston Ranch Company, a wholly owned subsidiary of Boswell Co., to operate and manage the farm. This is all spelled out in that exhibit.

In addition, the income to the new trust will pay the expenses of running the farm, plus an added fee of over $1 million every year to the Boswell subsidiary. Finally, at the end of ten years, the Bureau will allow the trust to resell the 23,000-acre ranch at a far higher price than before, providing a projected $28 million capital gain to whichever salaried employees of the Boswell Co. are still left in the trust.

All of these figures have been provided to us by the Interior Department. As you know, the Secretary of the Interior recently disapproved this trust, but then based on some statement of construction that was provided to the Secretary, he has now approved it.

In our view, there is simply no resemblance between this elaborate corporate reorganization and the historic goals of the reclamation program or the goals of the Reclamation Reform Act.

There is simply no way to reconcile the Bureau's approval of this profit-sharing plan which retains the control of the farm in the Corporation, the Boston Ranch Company, with the mandate of the 1982 RRA to limit subsidies to farms of 960 acres.

We believe an immediate investigation is needed into the process that allowed official approval of this trust and farm management arrangement, both at the regional level and at the secretarial level. We urge you, Mr. Chairman, and your colleagues in the Congress to take whatever measures are necessary to put a stop to this rampant pattern of large scale paper farms evading the acreage and subsidy limitations.

Until the Federal limitations on water subsidies are seriously enforced by the Bureau, the forces driving the environmental degradation I described above will not change, even if the Bureau agrees to fix particular environmental problems.

Another area that the Reclamation Reform Act addresses is conservation, water conservation. There is also a problem with the water conservation provisions of the Bureau's rules. About 280 of the 300 CVP districts in California have prepared conservation plans as required by the RRA, but most of the plans are rudimentary and the Bureau has adopted guidelines that fail to provide for implementation or enforcement. Mr. Chairman, we appreciated very much that question about, why aren't they being implemented, and shouldn't there be a rule that they should be implemented.

It seems to us the most logical thing in the world. One cannot read the debate and legislative history of the Reclamation Reform Act without coming away with a very clear sense that Congress not only wanted plans written, they wanted them implemented. They didn't want them just put into a library. And yet the Bureau refuses to take that extra step.

The law requires definite goals, appropriate implementation measures, and a timetable. Unfortunately, the Bureau interprets this to mean that as long as there is a plan, and it has more than one goal, more than one measure, and a schedule, it is acceptable.

We believe the Bureau should specify more rigorous requirements for the plans and develop an implementation strategy. During contract renewals, future deliveries could be conditioned on effective implementation of these water conservation plans.

Next I'd like to speak about the environmental effects of the CVP. We are pleased to see that Congress in general and this Subcommittee in particular are becoming increasingly concerned about these environmental impacts. The other speakers on this panel will address the various specific environmental effects of the Federal government's past and present practices.

Allow me just to note at the outset that among the many examples of environmental impacts are serious fish declines, including yearly fish kills in the rivers due to temperature problems and lack of flows; the destruction of a salmon in the San Joaquin River; the collapse of the striped bass index in the Delta; lack of firm water supplies for refuges and other wetlands; the contamination of Kesterson Reservoir by selenium; the spread of Kesterson-like problems of toxic drainage to the lower San Joaquin Valley; drainage problems elsewhere in the Central Valley, including discharges into the Grasslands area and into the San Joaquin River; and the decline of water quality in the River and in the Delta, and lack of flows necessary to protect other beneficial uses in the Bay-Delta Estuary.

Senator **Bradley**. Could you wrap it up, Mr. Candee?

Mr. **Candee**. All right. The Bureau now faces a special opportunity to address these problems and implement its new mission. We believe a very good example would be the renewal of the 40-year contracts. The discussion before about whether or not an EIS helps I think is very important here. The EIS is a process of encouraging public participation and encouraging the Bureau to explore alternatives. The time is now for the Bureau to look at these environmental impacts and the way that it might be able to mitigate them. We think that the EIS process is the natural way to do that.

I might point out that long before NRDC and the 14 other environmental and fishing groups brought their lawsuit to challenge the contract renewals, we made numerous efforts to open up a dialogue with the water users, with the Bureau of Reclamation. In fact, I even spoke to Mr. Kennedy himself about people we might contact in trying to promote that kind of dialogue. I think all of the environmental people wanted to sit down and try to talk about what do we do about the San Joaquin River. And we were rebuffed at every turn.

Nobody wanted to sit down and talk to us. Well, I can't say that, I think actually some people did, but there was a sense among the community and the prime water users that we're all going to hard line it, we're going to hold out, everybody has a right to the automatic renewal, we're not going to negotiate anything about flows.

And so really, litigation was the only alternative left to the environmental community, just to get Interior to focus on what their alternatives are.

Thank you, Mr. Chairman, I'd be happy to answer any questions.

Senator **Bradley**. Thank you, Mr. Candee.

[The prepared statement of Mr. Candee follows, additional material has been retained in subcommittee files:]

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Testimony of the

NATURAL RESOURCES DEFENSE COUNCIL

On Federal Water Policy
in California

Subcommittee on Water and Power
Committee on Energy and Natural Resources
United States Senate

Sacramento, California

August 29, 1989

Submitted by:

Hamilton Candee
Karen Garrison
Western Water Project

I. Introduction

My name is Hamilton Candee and I am a senior project attorney in the San Francisco office of the Natural Resources Defense Council (NRDC). NRDC is a national non-profit environmental organization with over 115,000 members nationwide. We are committed to protecting the country's natural resources and to that end, have worked for many years on promoting the conservation and rational use of western water resources. In particular, NRDC's Western Water Project has been centrally involved in many of the significant federal water issues affecting California. For example, we have worked on ending the contamination of Kesterson Wildlife Refuge, implementing the subsidy limits of reclamation law, strengthening water quality standards for the San Francisco Bay-Delta Estuary, and requiring an environmental impact statement on water contract renewals.

We commend you, Mr. Chairman, for holding these hearings on issues of critical importance to California's future. We welcome your Subcommittee's strong interest and hope that with increased Congressional oversight will come improved sensitivity by the Bureau of Reclamation to environmental concerns. We believe that the federal government certainly can play a more positive role in protecting the state's fish, wildlife, and other environmental resources.

The Bureau of Reclamation did not build its reputation on sensitivity to such issues. But in 1987, it announced its decision to turn the corner and change its mission, for the first time deemphasizing construction in preference to water conservation and environmental protection in its huge projects, including the Central Valley Project (CVP). Yet many of the Bureau's current and planned activities fail to promote the goals of efficient and environmentally sensitive management; indeed, they actively undermine these goals. For the next few minutes, I will discuss some of the sources of these problems and make recommendations for correcting them.

II. Federal Water Subsidies

One of the fundamental forces that shapes the California water system is the availability of federal irrigation water at subsidized rates. Many in California believe that these subsidies have outlived their original social purpose and, given the current competition over limited supplies, frequently lead to unreasonable use of water. The Bureau has intensified this problem by adopting regulations and rate-setting policies that expand the subsidy far beyond the limited interest subsidy intended by Congress. In particular, the Bureau has failed to implement the acreage limitations on subsidized water, adding to the CVP's serious environmental impacts.

The Congressional Budget Office has pointed out that subsidies "blunt western farmers' incentive to conserve water and encourage cultivation of water-intensive crops, such as cotton or rice, in arid regions."[1] According to a California Department of

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[1] Congressional Budget Office, Efficient Investments in Water Resources: Issues and Options xiv, August 1983.

Water Resources (DWR) report:

> "the market prices of CVP irrigation water have been ... so far below cost for a contract period of forty years [that] ... poor-quality lands have been brought into irrigation production that otherwise likely would not have occurred."[2]

The irrigation of such lands without adequate drainage facilities has led to a damaging build-up of salt in soils, in some cases causing devastating effects on wildlife due to selenium toxicity and reducing the quality of water in the Delta.

Perhaps most importantly, subsidies increase the pressure for new projects, upstream diversions and additional exports from the Delta by protecting the water user from one of the most important mechanisms for regulating use -- price. As a senior economist with the Federal Reserve Bank observed:

> "If water were priced higher, final users would have a greater incentive to conserve, the projected demand would be lower, and some or all of the proposed new water facilities would not be required."[3]

Dams and other Bureau facilities, in turn, have caused serious deterioration of the state's fish and wildlife resources -- blocking the downstream transport of gravel needed for fish spawning, diminishing flows needed for migration, altering water temperatures and water quality, and diverting flows necessary for the support of wetlands and waterfowl populations. Such problems have been aggravated by the Bureau's failure to commit firm water supplies to refuges.

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[2] California Department of Water Resources, Reconnaissance Report, State Operation and Management of the Central Valley Project 21, December 1982.

[3] Levy, Pricing Federal Irrigation Water: A California Case Study, in Federal Reserve Bank of San Francisco, Economic Review 35, Spring 1982, p. 32.

These examples illustrate the important link between fish declines, dry refuges, and the degradation of Delta water quality on the one hand and the lack of enforcement of federal acreage limitations and other Bureau failures, on the other. This tension is heightened by the Bureau's recent decision to automatically renew all of its existing 40-year contracts, rather than study and explore the various alternatives available to it.

We recognize that many farmers value the environment and take care to use water wisely. Nevertheless, when water costs are low, conservation investments may not make economic sense.[4] Farmers who do value the environment may thus fight an uphill battle as long as the Bureau's pricing practices fail to provide an incentive to conserve.

There are several ways to remedy this situation. For example, some districts have instituted their own incentive systems by adopting a tiered pricing structure, in which the price of water rises rapidly for those whose water use per acre exceeds the district average. Studies show that such systems encourage conservation with little influence on farm profits.[5] But such practices have so far been adopted by very few districts.

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[4] According to Dr. Claude Phene, research irrigation and soil scientist with the U.S. Department of Agriculture's Agricultural Research Service, when water costs are low, many growers are reluctant to invest the necessary capital to set up drip and other efficient irrigation systems. Argent, Gala, "Water Conservation: Helping Reduce Escalating Demands, in Western Water, July, August 1989.

A more far-reaching approach would be for the Bureau to revise its pricing policies in order, first, to eliminate illegal subsidies and, second, to incorporate the cost of drainage facilities and environmental mitigation. We believe that one of the starting points for the Bureau in implementing its new mission should be a reexamination of its approach to implementing Reclamation law, especially its pricing and acreage limitation practices.

III. Implementation of the Reclamation Reform Act of 1982

A. Acreage Limitations and Subsidies. The Reclamation Reform Act (RRA) offered an important handle for limiting subsidies and improving the overall efficiency of water use in the CVP. Although the Act did expand the acreage limitation and provide growers many other new benefits, it required in exchange a firm limit on subsidies and increases in water prices even for those below the acreage limit. Yet, contrary to Congressional intent, the Bureau approved regulations to implement the law that create major loopholes in the acreage limitations. These loopholes allow farmers to continue to receive subsidies for farms well in excess of the 960-acre limitation. They also result in considerable revenue losses to the government.

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[5] Salinity Drainage Task Force, Opportunities for Drainage Water Reduction, Water Resources Center, University of California, January 1988.

The recent example of the Westhaven Trust created by the J. G. Boswell Co. vividly demonstrates the failures of the Bureau's acreage limitation rules. Under this new trust, the Boswell Co., which is one of the largest cotton operations in the world, has transformed its 23,000 acre Boston Ranch in Westlands Water District into a new trust that benefits only the top 250 or so salaried employees of the Boswell Co. Because each employee's beneficial interest in the trust is proportional to the size of his or her salary and because Mr. Boswell apparently makes a much bigger salary than anyone else, he gets the biggest share of the trust. Moreover, the "trustee," which is a bank on which Mr. Boswell serves as a Director, has agreed to put the Boswell Co. back in charge of the farm, by hiring the Boston Ranch Company (a wholly owned subsidiary of Boswell Co.) to operate and manage the farm (see Exhibit 1).

In addition, the income to the new trust will pay the expenses of running the farm, plus an added "fee" of over $1 million a year to the Boswell subsidiary. Finally, at the end of ten years, the Bureau will allow the trust to resell the 23,000-acre ranch at a far higher price than before, providing a projected $28 million capital gain to whichever salaried employees of the Boswell Co. are still left in the Trust. (All of these figures are drawn from Interior Department documents recently provided to the NRDC under the Freedom of Information

Act.)

In our view, there is no resemblance between this elaborate corporate reorganization and the historic goals of the reclamation program or the goals of the Reclamation Reform Act. There is simply no way to reconcile the Bureau's approval of this profit-sharing plan with the clear mandate of the 1982 RRA to limit subsidies to farms of 960 acres.

We believe an immediate investigation is needed into the process that allowed official approval of this trust and farm management arrangement. We urge you and your colleagues in the Congress to take whatever measures are necessary to put a stop to this now rampant pattern of large scale "paper farms." Until the federal limitations on water subsidies are seriously enforced by the Bureau, the forces driving the environmental degradation I described above will not change, even if the Bureau agrees to fix particular problems.

B. Conservation Plan requirement. Although the major abuses in the Bureau's RRA rules are in the pricing and acreage limitation areas, there is also a problem with the water conservation provisions. About 280 of the 300 CVP districts in California at last have prepared conservation plans as required by the RRA, but most of the plans are rudimentary and the Bureau has adopted guidelines that fail to provide for implementation or enforcement. The law requires definite goals, appropriate implementation measures, and a timetable. The Bureau apparently interprets this to mean that as long as there is a plan and it has more than one goal, more than one measure, and a schedule, it is acceptable. Furthermore, the Bureau accepts as adequate almost any water-reducing measures, including weed removal and other routine management activities.

The Bureau should insure that districts write better plans and that they take their plans off the shelf. The Imperial Irrigation District's plan provides a good model of what could be done. Through regulations, the Bureau should specify more rigorous requirements for the plans and should develop an implementation strategy, including a frequent evaluation process and enforcement mechanisms. During contract renewals, future deliveries could be conditioned on effective implementation of the plans. The Bureau should also investigate incentive programs for conserving water (e.g. those that allow the marketing of saved water if a portion goes for fishery purposes). Funding (through charges to contractors, when appropriate) should be increased for the implementation, monitoring, and enforcement of these programs.

IV. Environmental Effects

We are pleased to see that Congress in general and this Subcommittee in particular are becoming increasingly concerned about the environmental impacts of Bureau projects and especially the possibility of alleviating these impacts here in California. Other speakers on this panel will expand on the effects of the federal government's past and present practices and possible solutions to those problems. We will just note at the outset that among the many examples of environmental impacts are: serious fish declines, including yearly fish kills in the rivers due to temperature problems and lack of flows; the destruction of a salmon run in the San Joaquin River; the collapse of the striped bass index in the Delta; lack of firm water supplies for refuges and other wetlands; the contamination of Kesterson Reservoir by selenium; the spread of Kesterson-like problems of toxic drainage to the lower San Joaquin Valley, where toxic exposure is heightened by the lack of alternative habitat for waterfowl; drainage problems elsewhere in the Central Valley, including toxic discharges through or around the Grassland area and into the San Joaquin River; the decline of water quality in the San Joaquin River and the Delta; and the lack of flows necessary to protect beneficial uses in the San Francisco Bay and Delta.

V. Special Opportunities

The Bureau now faces special opportunities to address some of these problems and implement its new mission. One such opportunity is the renewal of 40-year CVP water contracts. The first group of these contracts -- for the 28 Friant Unit contractors --started expiring in February 1989. Despite requests by the Environmental Protection Agency (EPA), the internal advice of the U.S. Fish and Wildlife Service (FWS), and a lawsuit by NRDC and 14 other fishing and environmental groups, Secretary of the Interior Lujan has decided not to prepare an environmental impact statement (EIS) before signing the first renewal contract for the Orange Cove Irrigation District. This issue has particular significance now because Secretary Lujan temporarily suspended further contract negotiations while his staff considers the recommendation of the Council on Environmental Quality that an EIS be performed.

The outcome of this case is likely to affect not only the 28 Friant contracts but also hundreds of other contracts with districts in the CVP in California as well as in Idaho, the Columbia Basin and elsewhere in the West. Contract renewals provide a key opportunity for the Bureau to promote efficiency and improved drainage management by farmers. They also enable the Bureau to redress some of the past harms caused to fish and wildlife by meeting agency responsibilities for environmental mitigation. Therefore, we make the following recommendations concerning these contract renewals:

o The Bureau should perform a programmatic EIS on the entire CVP contract renewal program. This study should consider alternatives which, for example, mitigate the environmental damages caused by the project, take full advantage of opportunities for water conservation, condition entitlements on effective drainage management, and shorten the contract period and the period needed to accomplish full repayment. Future contract negotiations should be based on the results of such a study.

- As part of this study and prior to further contract negotiations, the Bureau should perform a full environmental analysis of CVP rate-setting policy. The current rate-setting policy gives Friant contractors close to 80 years to repay their original construction costs, all without interest. We believe rates should be set to insure more reasonable pay-back periods in keeping with federal law, and we also believe the new rates should include payment for the costs of water needed to restore wetlands and fisheries as mitigation for the projects.
- Congress should also consider withholding authorizations for new projects and funding for ongoing projects until Interior agrees to comply with NEPA and prepare an EIS on contract renewals.

The new water contracting program for the uncommitted yield of the CVP provides another ideal opportunity for the Bureau to implement its new mission of resource protection. The Bureau has withdrawn its three draft EISs on the new water contracting program, but still says it intends to market up to one million acre feet of water. An example of the Bureau's old-style approach to the first draft was its total disregard of pricing and economics when it estimated the demand for this water.

We believe the Bureau should take this opportunity to commit firm supplies of water to urgent fish and wildlife needs, as Congress has previously encouraged. In addition, we recommend the following:

- The Bureau should delay proposals to export additional CVP irrigation water until standards are set for the Bay/Delta Estuary.
- The new contracting program should address not only the needs of contractors but the need for flows to mitigate the current and historic environmental degradation caused by the CVP.
- The Bureau should seize this opportunity to reorient federal policy in California before signing a new generation of contracts. For instance, it could begin by considering whether demand exists for water at specific, realistic prices rather than asking water districts for an abstract wish list. Strategies like those discussed above for reducing drainage pollution and encouraging conservation via contract renewals should also be considered for new contracts. The Bureau should also consider excluding some portion of its supplies from long-term contracting to serve as a potential buffer against the impacts of climate change.

We believe that the above examples, along with such activities as the wheeling/purchase contract negotiations under § 10(h) of the COA and the Bay/Delta hearings, offer opportunities for mutually beneficial cooperation between environmentalists and water development interests. In the case of contract renewals, the Bureau could begin to foster cooperation by fully complying with NEPA, a process designed not to dictate a particular outcome, but to promote public participation and informed and environmentally sensitive decision making. In the case of new contracts, the Bureau should incorporate into its existing priorities the goal of preserving and restoring fisheries, and should take seriously its present goal of optimizing water for refuge use. Meeting the needs of these interests should be given equal consideration with supplying the Bureau's more traditional water contractors.

VI. Conclusion

With regard to limiting water subsidies and improving conservation, Congress made its intentions clear in 1982; the Bureau should revise its regulations, rate-setting policies and conservation-plan guidelines to match that Congressional intent. If the Bureau believes it needs a re-affirmation of that legislative intent to resist the pressure of its customers for more and more loopholes, then perhaps Congress should provide it. In any case, the status quo is unacceptable.

With respect to allocations for fish and wildlife purposes, we believe the Bureau already has the authority to make such allocations under current reclamation law and CVP authorizations. But there is ample evidence that the Secretary of the Interior and the Bureau interpret the agency's mandate too restrictively. Indeed, Interior has shown rather striking inconsistencies on such issues recently.

For example, in withdrawing the draft EISs on the new water sales, Secretary Lujan publicly affirmed that the states have "primary authority for determining basic water rights and entitlement on the basis of beneficial use, water quality and other regional considerations."[6] Yet, this spring, the Secretary added to the new long-term Friant contracts language guaranteeing that "The United States" (i.e., not just Interior) "shall defend project rights to divert and use water delivered under this agreement before all courts and agencies exercising jurisdiction over said rights."[7] If Interior is eager to assist the states in allocating CVP water to fish and wildlife, we question why the Secretary is offering apparent promises to defend the irrigators against any state reallocations.

Behind this contradiction, in our view, lies the Bureau's continuing reluctance to accept responsibility for preserving and expanding environmental uses of water. We therefore urge Congress to reaffirm and strengthen the Bureau's environmental mandate, reemphasizing the need to allocate CVP water for environmental purposes. California has been endowed with fish and wildlife resources of national and international importance. We believe Congress should do whatever it can to expand the Bureau's efforts to protect these resources.

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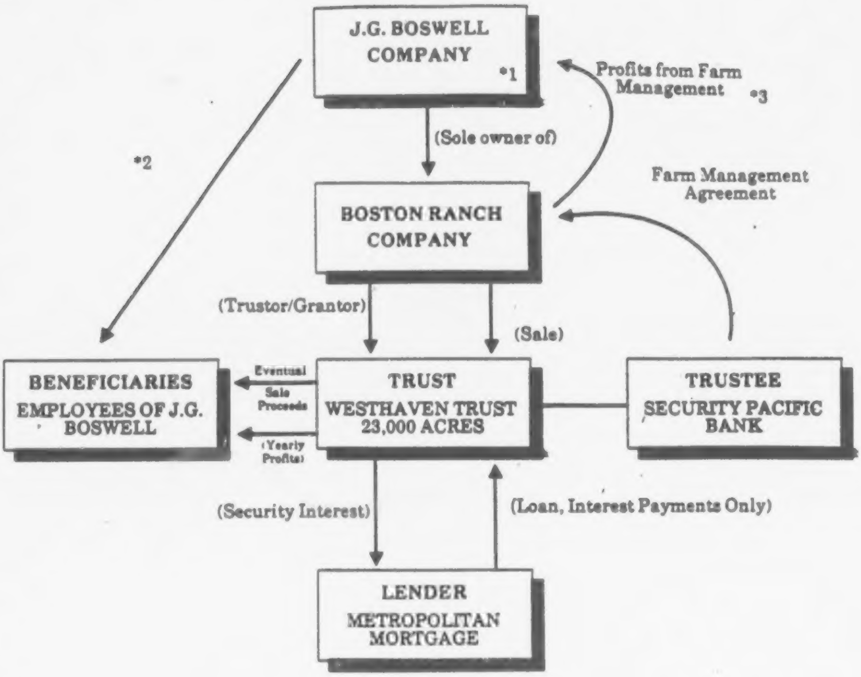
[6] Department of Interior News Release, "Secretary of the Interior Lujan directs the Bureau of Recalmation to revise and reissue Central Valley Project Water Contract Draft Environmental Impact Statements," May 25, 1989.

[7] See Memorandum to the Commissioner, Bureau of Reclamation, from Secretary of Interior Manuel Lujan, Re: Water Service Contract with Orange Cove Irrigation District, April 11, 1989.

Appendix I


J.G. BOSWELL COMPANY
*1
Profits from Farm Management
*3
(Sole owner of)
*2
Farm Management Agreement
BOSTON RANCH COMPANY
(Trustor/Grantor)
(Sale)
BENEFICIARIES
EMPLOYEES OF J.G. BOSWELL
Eventual Sale Proceeds
(Yearly Profits)
TRUST
WESTHAVEN TRUST
23,000 ACRES
TRUSTEE
SECURITY PACIFIC BANK
(Security Interest)
(Loan, Interest Payments Only)
LENDER
METROPOLITAN MORTGAGE

*1 J.G. Boswell Co. farms 150,000 acres (23,238 acres would be size of Westhaven Trust)

*2 Benefits designated on a yearly basis based on ratios determined by employee salaries

*3 Some J.G. Boswell Co. employees will carry out farm management agreement under sub-contract with Boston Ranch

Senator **Bradley**. Mr. Krautkraemer.

STATEMENT OF JOHN W. KRAUTKRAEMER, SENIOR ATTORNEY, ENVIRONMENTAL DEFENSE FUND

Mr. **Krautkraemer**. Thank you, Senator Bradley, Congressman Fazio. I also have submitted lengthy written comments for the record, and I will summarize those, I hope, very briefly.

I'd like to start by echoing Mr. Candee's thanks to the Subcommittee for holding this hearing. I think we're at some important junctures in California's water future. And obviously the role of the Federal Government in that future is quite important.

While this hearing focuses primarily on the Bureau of Reclamation, which is the largest diverter of water in the State, I'd also like to point out that there are other Federal agencies that have important roles in this area, including U.S. Fish and Wildlife Service, the National Marine Fishery Service, USFS, which play important roles as resource agencies in developing information and measures to protect California's environmental resources.

The Environmental Protection Agency has important oversight functions under the Clean Water Act. And the Corps of Engineers has an important role in the San Francisco Bay, which my testimony will cover, concerning dredging. And also will have an important role in the environmental review process for some of the measures which the Department of Water Resources is pursuing to increase diversions from the Sacramento-San Joaquin Delta.

So while the Bureau obviously plays an important role, the Federal role goes much beyond just the Bureau of Reclamation.

I've been asked by the Subcommittee to focus my comments, my testimony on the Bay-Delta hearings. You've already heard some comments from Chairman Maughan on these hearings. I'd like to add a few comments to that. First of all, I would agree that they are important, they will impact a large number of water users in this State, and they will impact the future of the Bay-Delta Estuary, which is an estuary of local, state and national significance.

The Bay-Delta Estuary is one of the estuaries designated in the National Estuary Program, in the 1987 Clean Water Act, as requiring priority considerations. So there's a strong national interest in the Bay-Delta as well as State and local Bay Area interests.

I guess I would start out my comments by disagreeing with Chairman Maughan's statement that there is a large degree of uncertainty in the biological information on the need for improved protections for the Bay-Delta Estuary.

Where there may be some areas where that information can be refined and should be refined, all of the principal resource agencies have participated in some 56 days of hearing that have already occurred, including the Department of Fish and Game and the U.S. Fish and Wildlife Service, as well as environmental and fishery organizations, presented abundant evidence that the existing standards for fresh water flow into the Estuary are inadequate, and presented recommendations on increasing fresh water flow.

Some of that evidence has been summarized in detailed testimony that I presented.

And we've also seen in practice that existing standards have not worked. Those standards which were developed in 1967 were premised on attaining certain levels of striped bass protection, and as detailed in my written testimony, the standards have come nowhere near achieving the levels of protection that were promised. So I think there's little doubt that the Bay-Delta Estuary needs more fresh water.

I'd also like to emphasize the San Francisco Bay portion of the Estuary. Mr. Maughan talked mostly about the Delta, but at present, there are no standards in place guaranteeing fresh water flow into San Francisco Bay. That is one of the subjects of the ongoing hearing. The evidence is very strong that San Francisco Bay also is entitled, as a separate area, to increased fresh water flow.

And in fact, the support for the proposition that there is a need for increased fresh water flow came from a draft plan which the State Water Resources Control Board issued in November of last year, which called for increases in springtime flows of about a million and a half acre feet per year. And that plan specifically recognized that the existing standards do not provide a balance in protecting various beneficial uses, and particularly that the scales are tipped against the fish and wildlife resources of the Estuary.

As you may well know, that process was aborted as a result of intense pressure from water development agencies, and the whole Bay-Delta hearing process is now hung up and will go on at best for several more years, and at worst, indefinitely.

The main point of my testimony here today is not so much debate the pros and cons of the biological evidence, though. I think that is an issue which is being addressed in the Bay-Delta hearings and in other formal and informal legislative and agency forums in the State. The point I would like to make, and I think Mr. Maughan touched on this, is that there is an ongoing conflict within the State about what to do with the Bay-Delta Estuary.

Environmentalist, fishery organizations on the one hand point to the evidence that we need more fresh water flows, development interests that have stake in continuing and increasing diversions, argue otherwise, either because they claim the biological evidence is insufficient, or even if it's there, that other needs of the State outweigh fish and wildlife needs.

The point, though, is that there is need to resolve this issue. And from our standpoint, it's imperative that while this conflict is being resolved, that there be no new efforts to increase commitments for new diversions from the Estuary.

Unfortunately, the Bureau of Reclamation is engaged in several efforts which I detailed in my written testimony, and which I'll briefly summarize here.

The first is the new water contracts, which have already been discussed by the previous panel, and in questions from the Subcommittee. The efforts to enter into new long-term contracts are temporarily on hold as a result of a lot of adverse comment that the Bureau, the Department of the Interior, received on the draft EIS's. The energy and water development appropriations bill on the House side contains a moratorium which would prevent the Secretary of the Interior from signing new contracts until October

1st of next year, of 1990. My understanding is that there is no similar provision in the Senate appropriations bill.

And one recommendation I would make to the Subcommittee is that that provision remain intact in the final bill.

The second area is the so-called 10(h) contract. This would be an agreement which is entered under article 10(h) of the coordinated operations agreement, in which the State Department of Water Resources and the Bureau of Reclamation would essentially exchange excess wheeling capacity, excess transportation capacity in the State system for water supplies which the Bureau claims that it has.

Our understanding is that such a contract, which is currently being contemplated, would result in diversions of up to half a million acre feet a year, which is a substantial increase in diversions.

While EDF supported the COA, and I think you can point to the COA as one example where various and diverse water interests in the State have come together and reached an agreement which has mutual benefits to everybody, we also early on in the process, even while the COA negotiations were going on, raised concerns about article 10(h), HR3113, which was the authorizing legislation for the COA, which was authored principally by Congressman Miller, contains a provision requiring Congressional approval of any Federal participation in a wheeling and purchase contract.

EDF, and I'm sure other environmental organizations, fishery organizations, will be opposing the wheeling and purchase contract until the environmental mitigation responsibilities of the Bureau and DWR, for that matter, in the Bay-Delta are fulfilled, and in other environments that could also be affected by such an agreement.

The third project which the Bureau is actively pursuing at the moment is the so-called intertie, that would be constructed by Westlands Water District between the Federal Delta-Mendota Canal and the State Aqueduct.

To put it bluntly, the purpose, as best I can tell of this intertie is to circumvent State Water Board jurisdiction. The Bureau of Reclamation has filed a petition with the Water Board, asking that they be permitted to use the State's pumping plant to pump Federal water.

And the State has indicated that it will put that petition on hold until later in the Bay-Delta hearing process, to allow resolution of some of the issues that are raised in that proceeding.

What the intertie would do would allow the Bureau to pump water out of the Federal pumping plant at Tracy into the Delta-Mendota Canal. A few miles downstream, that water would be transferred to the California Aqueduct, because as you move further down the Delta-Mendota Canal, they're at capacity limits, and then it would be transported into the California Aqueduct into San Luis Reservoir, in through the San Luis Canal into the Westlands service area.

There were some questions raised about whether or not this project would increase Delta diversion. There's no doubt it would increase Delta diversions. What's happening now is that the San Felipe unit is starting to come on line, and it's starting to use up capacity that was used by Westlands to divert interim water. What the intertie would do would be essentially to create new capacity for Westlands, and would result in an increased diversion of 125,000 acre feet per year.

The environmental review process, the environmental impact statement, environmental impact report under State law, in draft form have gone out, and have received a lot of adverse criticism. The State Water Board has actually gone on record in comments, the State Water Board staff, at least, has gone on record in comments as pointing out that the Bureau's current permits do not allow delivery of water to 50,000 acres in Westlands that currently receive federal irrigation water. And the State Board staff has said that they would expect that any new project would comply with State law in this matter, which would require a change in the Bureau's permits.

To move quickly into what I see as what are the needs, meaning California's future needs, well, I think it's apparent from what I just said that the Bureau of Reclamation, although it has made some specific——

Senator BRADLEY. If you could wrap up, Mr. Krautkraemer.

Mr. KRAUTKRAEMER. I'll wrap up very quickly. While the Bureau has in some ways made some efforts to address environmental concerns in this State, what's really needed is a fundamental shift in emphasis, away from its primary role as a water purveyor, which it apparently is continuing, as evidence by some of the things I just mentioned.

Instead, the Bureau should be cooperating and aggressively promoting ways to better use the supplies we already have. And we think that the principal way to achieve this is through freer water marketing, water transfers, which would provide a positive incentive to existing water users, primarily in the agricultural sector, to conserve water or otherwise to reduce their water use.

The end result would be in a sense to increase the overall pie that these various interests in California are competing over. If the Bureau continues on its present course of just trying to sell more water, I think that's a sure prescription for continued conflict.

Senator BRADLEY. Thank you very much, Mr. Krautkraemer.

[The prepared statement of Mr. Krautkraemer follows:]

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BEFORE THE UNITED STATES SENATE
COMMITTEE ON ENERGY
AND NATURAL RESOURCES

SUBCOMMITTEE ON WATER
AND POWER

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Sacramento, CA
August 29, 1989

Introduction

Senator Bradley, members of the Subcommittee, my name is John Krautkraemer, and I am an attorney with the Environmental Defense Fund in its Oakland, California office. On behalf of EDF I would like to thank you for holding this hearing today. The hearing is especially timely since over the next several years major decisions will be made in California concerning the allocation and management of the state's water resources. Because of the vast amounts of water controlled by the U.S. Bureau of Reclamation ("Bureau"), and because of the important role of the U.S. Fish and Wildlife Service ("USFWS"), the U.S. Geological Survey ("USGS"), the U.S. Environmental Protection Agency ("EPA"), and other federal resource agencies in helping to develop information and measures needed to protect California's aquatic environments, federal practices and policies could have a major influence on California's water future.

Unfortunately, past practices and policies have focused heavily on water development and have resulted in substantial and as yet unmitigated environmental degradation. There are, however, significant opportunities for reversing this focus and for federal cooperation and initiative in helping the state to accelerate the restoration of its rivers, lakes, estuaries, and other beleaguered aquatic environments.

As requested by the Subcommittee, my testimony today will focus on the ongoing proceedings before the State Water Resources Control Board ("Board") to establish freshwater flow requirements and other protections for the San Francisco Bay/Sacramento-San Joaquin Delta estuary (the "Bay/Delta hearings") and their importance to the state. I will also discuss various steps the Bureau is engaged in to increase water withdrawals from the estuary. Finally, I will conclude my testimony with some recommendations on steps the Bureau can take to move toward better management of California's water resources and to help restore the Bay/Delta and other environments while meeting legitimate consumptive water demands.

The Bay/Delta Estuary

The Bay/Delta estuary is one of the largest and most important estuarine systems on the Pacific Coast of the United States and is an asset of exceptional value to the Bay Area, the state, and the nation as a whole. It is home to a diverse array of resident and anadromous fish and provides important habitat for wildfowl, including migratory birds in the Pacific Flyway, and other wildlife. It supports a broad range of economic uses, including commercial and sport fisheries, recreational use, tourism, and real estate, and enhances the quality of life for all Bay Area citizens. As an estuary, the health of the Bay/Delta ecosystem is in large part dependent on the inflow of sufficient freshwater from upstream rivers.

The Bay/Delta watershed covers approximately 40 percent of the land area of California and includes the state's two major river systems, the Sacramento and San Joaquin, as well as other tributaries. There are thousands of water right holders in the watershed, including the Bureau, which holds permits for the federal Central Valley Project, and the California Department of Water Resources ("DWR"), which operates the State Water Project.

Water diverted from the Bay/Delta system is used for agricultural purposes in the Central Valley and for urban use throughout the state, including the Bay Area and the south coastal plain. In addition, drainage and other agricultural discharges in the Central Valley have the potential for affecting the Bay/Delta environment. It is thus obvious that decisions concerning protection of the Bay/Delta system could have a far-reaching effect on other water users in the state, and that, in turn, the ways water is used and managed by the Bureau, DWR, and other agricultural and consumptive water users in the state has a direct impact on environmental and other beneficial uses of the Bay/Delta estuary.

DWR, for the purposes of establishing a baseline against which various water development scenarios can be compared, has estimated average annual outflow to San Francisco Bay, absent water diversions, to be about 28 million acre-feet. In an average year (which has rarely occurred in the last twenty years), total water diversions in the Bay/Delta watershed reduce outflow by approximately one half. Diversions have the greatest impact in spring time, and in dry years, when the need for restoring freshwater flows is most critical. In the spring of critically dry years, such as the drought years of 1976-77, as much as 70 per cent (or more) of already low flows are diverted before reaching the Bay.

The Bureau is the single largest diverter of water from the Bay/Delta estuary and its tributaries. It currently has 7.3 acre-feet per year of water under firm yield contract (excluding Friant Dam), and in 1985 delivered approximately 6.6 million acre-feet of water. (U.S. Department of the Interior, Draft Environmental Impact Statement, Delta Export Service Area Water Contracting Program (December 1988) at pp., 2-14 to 2-15). Diversion of spring runoff to storage in large multi-purpose reservoirs, such as Shasta, Folsom, and Friant, contributes greatly to the serious reduction in spring flows in the estuary and its tributary rivers.

Congress recognized the importance of the Bay/Delta estuary and the federal interest in its protection when it directed the EPA Administrator to give "priority consideration" to the estuary under the National Estuary Program established in the 1987 Clean Water Act amendments (33 U.S.C. sec. 1330(B)). In addition, the U.S. Environmental Protection Agency has important oversight functions to ensure protection of Bay/Delta water quality. (E.g., 33 U.S.C. sec. 1313(c)).

The Bay/Delta Hearings

The Bay/Delta hearings began in 1987 and the first phase of evidentiary hearings ("Phase I") has been completed. The hearing process is designed to review and revise existing salinity and flow standards established in 1978 in the Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh and incorporated into Water Right Decision 1485 ("D1485").

The D1485 standards have proven to be woefully inadequate. The Board in 1978 designated the striped bass as an indicator species for judging the health of the estuarine fishery, and predicted that the standards it adopted would attain an average "striped bass index" of 79, with the longer-term goal of reaching the historical index level of 106. The striped bass index is a measure of young striped bass abundance sampled each spring at locations in the Delta and Suisun Bay.

However, striped bass populations plummeted in the back-to-back drought years of 1976-77 and have never recovered. Since 1976 the striped bass index has been considerably below predicted levels (with the exception of 1986) and has averaged only 22.9. In the last two years (1988, 1989) the index has been 4.6 and 5.1. While other factors have been identified as possible contributors to the decline of the bass, the evidence is overwhelming that a substantial increase in freshwater flow, particularly in spring months, is necessary if there is to be any hope of restoring striped bass populations. As a result of the 1978 standard's failure to attain the predicted striped bass index levels, the EPA in 1987 withheld federal approval of the striped bass standards under its Clean Water Act oversight authority. (Letter from Judith E. Ayers, Regional Administrator, EPA Region 9, to W. Don Maughan, Chair, State Water Resources Control Board (June 29, 1987)).

As the result of a 1986 state appeal court decision the Board's current hearing process is considering the effects on the estuary of all water users who divert water from the Delta or upstream, not just the effects of the Central Valley Project ("CVP") and State Water Project ("SWP"), which are subject to the D1485 standards. United States v. State Water Resources Control Board (1986) 182 Cal. App. 3d 82. However, the Board has indicated that it likely will focus initially on larger projects, such as the CVP and SWP. The court also charged the Board with considering not only the effects of freshwater diversions, but also of pollutant discharges on the estuary. In addition, the court determined that the Board has the power to impose permit conditions on the federal CVP. 182 Cal. App. 3d at pp., 134-137.

Evidence presented by federal and state resource agencies and environmental and fishery organizations during the first phase of the Board's hearings demonstrate the importance of freshwater flow, not just to striped bass but to the overall health and productivity of the Bay/Delta estuary. Some of this information is summarized in Exhibit 1. The organizations and principal agencies concerned with protection of fish and wildlife in the Bay/Delta estuary (eg., DFG, USFWS) were unanimous in concluding that existing D1485 standards are inadequate.

Some of the most important evidence on the need for freshwater flow in the Bay/Delta estuary is based on the work of federal agencies, often in cooperation with state agencies as part of the Interagency Ecological Study Program. For example, the U.S. Fish and Wildlife Service has done important work showing a strong relationship between freshwater flow in the Sacramento and San Joaquin Rivers and the survival of young salmon (smolts) migrating out to sea. Another example is the work of various researchers at the U.S. Geological Survey, which has greatly contributed to our knowledge of the San Francisco Bay system, and which was summarized in a 1986 article in Science included in Exhibit 1. And biologists for the Bureau of Reclamation have done important work linking freshwater flows to phytoplankton abundance in Suisun Bay which served as the basis for some of EDF's testimony during the first phase of the Board's hearings.

Responding, at least in part, to the abundant evidence on the need for improved Bay/Delta flows, the State Water Resources Control Board in November 1988 released a Draft Water Quality Control Plan for Salinity for the Bay/Delta estuary ("Draft Plan"). This Draft Plan proposed an average increase in spring (April-July) Delta outflows of about 1.5 million acre-feet per year, as well as increases in both Sacramento and San Joaquin River spring flows. While the Draft Plan was deficient in several important respects, including, for example, its failure to set standards specific to San Francisco Bay, it nevertheless represented a step toward better protection for the estuary and a recognition that the existing D1485 standards are deficient.

Indeed, the Draft Plan specifically noted that:

> [I]t should be recognized that biological resources have declined and are not experiencing the same degree of protection as other beneficial uses. Past balancing to protect biological resources has not been as effective as projected according to present evidence. (Draft Plan at p., 1-6).

Following the release of the Draft Plan, water development interests, including the Central Valley Project Water Association made up of federal water contractors, unleashed a barrage of political and media pressure on the Board seeking withdrawal of the Draft Plan. The Board in January 1989 did withdraw the plan and recently has developed a new schedule for its hearing process which will delay a final decision on Bay/Delta standards for at least several more years, and perhaps indefinitely. In a particularly controversial move, the Board has delayed consideration of most of the issues pertaining to freshwater flow until the the water rights phase of the hearing process, scheduled to begin next year. Given the substantial delay in the hearing process, it is essential that there be no further commitments to water diversions which affect the Bay/Delta estuary until protection of the estuary is assured. Unfortunately, the Bureau is engaged in several activities which could lead to substantial new diversions.

Bureau Efforts to Increase Diversions from the Bay/Delta System

There is considerable conflict among various competing water interests in California as to what measures are needed to restore and protect the Bay/Delta estuary. While EDF and other organizations interested in Bay/Delta protection point to the overwhelming evidence, confirmed in the State Water Resources Control Board's Draft Plan, supporting the need for improved freshwater flow guarantees for the estuary, consumptive water users with a stake in maintaining and increasing present levels of diversion from the Bay/Delta watershed maintain that the evidence is not conclusive enough to justify allocating greater amounts of water to the estuary, or that in any event the needs of agricultural and urban users outweigh the needs of the estuary.

These conflicting positions are at issue in the Bay/Delta hearings and in other formal and informal legislative and administrative forums in the state, and may, unfortunately, take some time to resolve. During this period, the only prudent course is to avoid additional new commitments to diversions from the Bay/Delta system which can further damage the estuary and make it more difficult in the future to take necessary remedial action.

The U.S. Bureau of Reclamation, however, has embarked on an entirely different course and is currently engaged in several ongoing efforts to increase substantially the amount of water exported from the Bay/Delta system and its tributaries. The largest scale effort is the temporarily-delayed process for contracting an additional 1.5 million acre-feet of water from the Central Valley Project. In December 1988 the Bureau released three Draft Environmental Impact Statements designed to lead to new Bureau water contracts in the Sacramento River, American River, and Delta Export service areas. Following substantial adverse comment on the proposed new contracting from numerous environmental and fishery organizations, and from federal, state, and local government agencies, the Bureau withdrew the Draft EISs. Moreover, H.R. 2696, the Energy and Water Development Appropriations Bill for 1990, contains a moratorium prohibiting the Secretary from executing any new long-term water supply contracts until October 1, 1990. However, the Bureau still apparently intends to re-issue the Draft EISs and proceed with the contracting process at some future time.

The Bureau's attempt to contract for delivery of additional water disregards its obligation to mitigate not only the CVP's impacts on the Bay/Delta system but also on other aquatic environments throughout the state. These include California's rivers, such as the American, the Trinity and the San Joaquin, and its wildlife refuges. Entering into new contracts at this time is particularly inappropriate given the ongoing Bay/Delta hearing process and other forums in which various interests in the state are addressing the needs for additional allocations of water for environmental purposes.

In addition to the execution of new long-term contracts, the Bureau is also actively involved in at least two more proposals which would lead to increased Delta exports. The first is a wheeling and purchase contract with the California Department of Water Resources under Article 10(h) of the Coordinated Operations Agreement ("COA"). Under such a contract, the Bureau would sell interim water to the state in exchange for the use of excess capacity in the state's water conveyance system. Because of capacity limitations in the federal Delta Mendota Canal, the Bureau is in need of this capacity to increase CVP exports.

While EDF was supportive of the COA because it for the first time resulted in a formal commitment by the Bureau to comply with Bay/Delta standards, we also identified early in the COA negotiation process our concerns about the wheeling and purchase contract and its potential for increasing Delta exports. H.R. 3113 (Miller), which authorized the execution of the COA, specifically requires that Congress approve federal participation in any wheeling and purchase contract authorized under section 10(h).

The Bureau and DWR have recently announced their intent to proceed with a wheeling and purchase contract and have scheduled scoping sessions for the environmental review process. It is our understanding that the agencies contemplate exporting up to 500,000 acre-feet of additional water from the Delta under the contract. The export of this large amount of water would substantially increase existing environmental problems in the

Bay/Delta estuary and make it more difficult to improve flow conditions. EDF and other organizations will vigorously oppose the proposed wheeling and purchase contract in the absence of protective Bay/Delta standards, and urge Congress to exercise its oversight function to prevent further degradation of the Bay/Delta estuary. Earlier correspondence and testimony by EDF outlining these and other concerns are included in Exhibit 2.

Another proposal currently being advanced by the Bureau to increase Delta exports is the plan for Westlands Water District to construct an "intertie" connecting the federal Delta Mendota Canal with the state's California Aqueduct. After construction, the intertie would be operated by the Bureau as part of the CVP. The purpose of this project is to circumvent the jurisdiction of the State Water Resources Control Board over a pending petition the Bureau has filed to allow it to divert water from the Delta at the state's Harvey O. Banks pumping plant, which the Board has said it will not consider until later in the Bay/Delta hearing process. Under this Rube Goldberg-like proposal, CVP water would be pumped from the federal Tracy Pumping Plant and then transferred to the state's aqueduct, avoiding the capacity limitations further down the Delta-Mendota Canal.

The intertie would allow continued deliveries of interim water to Westlands which otherwise would be curtailed as existing Delta Mendota Canal capacity is used instead to increase deliveries to the San Felipe Unit, which only recently has began to receive CVP water. The net result would be to increase Delta exports by 125,000 acre feet per year.

The Bureau and Westlands have issued a Draft Environmental Impact Report/Environmental Impact Statement on the proposed intertie and have received negative comments on the proposal from EDF and other organizations and agencies, including the U.S. Environmental Protection Agency. Among other things, the intertie would allow the Bureau to continue to deliver irrigation water to 50,000 acres of land within Westlands which are outside the authorized place of use in the Bureau's state water right permits. The State Water Resources Control Board staff, in comments on the proposed intertie, has stated that it "believes that any new project must obtain all necessary water right approvals before it is operated or be subject to appropriate enforcement actions." (Memorandum from Walter G. Pettit, Chief Division of Water Rights to Dr. Gordon F. Snow, Assistant Secretary for Resources, June 2, 1989 at p., 2).

The above projects are evidence that the Bureau of Reclamation, despite some recent efforts to address environmental concerns, has in several important aspects continued on a course of "business-as-usual". Despite the urgent need for greater allocations of water to the environmental uses, the Bureau is actively working to increase commitments of water to irrigation and other consumptive uses. These actions ignore or minimize measures which have the potential for increasing the efficient use of water already being used by federal contractors. Chief among these measures is water transfers -- allowing existing users to transfer, for economic consideration, water they are currently using to new users. Water marketing holds the potential for meeting new demands with existing supplies while also alleviating the impacts on present users of allocating more water to the Bay/Delta estuary and to other environmental uses.

Water Transfers

The concept underlying water transfers, or free water marketing, is simple: provide an incentive through market-like mechanisms for existing water users to conserve or otherwise reduce their water use by allowing them to sell, lease, or otherwise transfer water to new users. The result is to increase the overall efficient use of existing water supplies.

EDF first set forth its argument for water transfers as an alternative to traditional water development in a detailed way in a study published in 1983, "Trading Conservation Investments for Water, A Proposal for the Metropolitan Water District of Southern California to Obtain Additional Colorado River Water by Financing Water Conservation Improvements for the Imperial Irrigation District." The study documented the economic benefits to both the Metropolitan Water District of Southern California and the Imperial Irrigation District if Metropolitan were to obtain an incremental water supply by investing in conservation improvements in Imperial's irrigation system. In December 1988, following several years of negotiations, Metropolitan and Imperial reached an initial agreement for the transfer of 100,000 acre-feet of conserved water per year. An explanation of this agreement, written by the general managers of the two agencies, appeared in a recent EDF newsletter and is included in Exhibit 3.

Beginning in the early 1980's, water transfers have become an integral part of California's water future. California Water Code section 109(a) declares it to be "the established policy of this state to facilitate the voluntary transfer of water and water rights where consistent with the public welfare and the place of import." Subsection (b) of Section 109 directs the State Water Resources Control Board and other state agencies to encourage water transfers. Other provisions in state law protect water sellers or transferors from forfeiture of their water rights (Water Code sec. 1244), provide similar protection to encourage water conservation (Water Code sec. 1011(a)), and require agencies with conveyance facilities to make those facilities available, under specified conditions (including compensation), for water transfers (Water Code sec. 1810-1814). These, and other recent state legislation, emphasize the importance of water transfers as a means of meeting California's future water demands.

The potential for water transfers in California is large. The transfer of only 10 percent of the amount of water currently being consumed by agriculture in California would make about 3 million acre feet of water available for new uses with overall statewide economic benefits. (See H.J. Vaux and R.E. Howitt, Managing Water Scarcity: An Evaluation of Interregional Transfers, 20 Water Resources Research 785-792 (July 1984)). This amount of water would meet virtually all of the state's projected new demand through the year 2020. (Id.).

Water transfers hold particular promise for helping to solve problems related to the farming of agricultural lands on the west side of the San Joaquin Valley that currently experience drainage problems. By providing an incentive to improve irrigation efficiency and reduce water use, transfers would raise revenues that local agricultural interests could use both for improving their irrigation systems and to alleviate water quality problems associated with drainage discharges.

Moreover, freer water transfers would also help avoid or alleviate the economic impacts of allocating more water to the Bay/Delta estuary or other environmental uses. Marketing would help ensure that water is put to the highest economic use, so that any overall reductions in agricultural water use mandated by a greater allocation of freshwater to environmental purposes would result in shifts away from the least profitable uses.

Finally, transfers have the potential for avoiding or minimizing conflicts between potentially competing environmental uses. As an example, if water for wildlife refuges comes from existing agricultural uses, rather than from new Delta exports, both environments benefit.

Attached to this testimony as Exhibit 3 are various materials summarizing the importance of water transfers to

California's water future and the reasons why EDF believes that transfers are the best way to accommodate the competing demands for water in this state.

In December 1988, the U.S. Department of the Interior announced a policy on water transfers. The policy recognizes the important role transfers will have in meeting water demand throughout the Western states, and pledges federal cooperation in assisting willing buyers and sellers to implement transfers. Interior deserves strong praise for its positive approach to transfers.

At the same time, however, the policy generally takes a "hands-off" approach in terms of Interior actively recommending or promoting transfers. This approach is evident in the Bureau's Draft Water Contracting EISs. In these documents, the Bureau gives only cursory mention to water transfers and concludes that "transfers in general are not a reasonable alternative to meeting the considerable needs for CVP water that Reclamation has identified." (U.S. Department of the Interior, Draft Environmental Impact Statement, Delta Export Service Area Water Contracting Program (December 1988) at p. 1-29).

Thus, there is a significant gap between federal policy and federal practice with respect to water transfers. If federal policy is really to encourage water transfers, the Bureau must take a more aggressive role in identifying potential transfers and in giving priority to transfers as the means of meeting new water demands.

Conclusions and Recommendations

The Subcommittee has posed three questions which raise the issue of how the Bureau of Reclamation can better address environmental concerns and help to foster mutual cooperation between various water using sectors in California. Following are EDF's responses to these questions, which will serve as concluding remarks and recommendations.

Question 1: How should the Bureau implement its new mission in California? Please provide specific answers.

The short answer to this question is that the Bureau should de-emphasize its role as a water purveyor and focus instead on ways to meet various water needs through better management of water already being used. The Bureau for too long has seen its primary mission as the delivery of cheap irrigation water. A true commitment to a new environmental mission requires a recognition by the Bureau that it has substantial mitigation obligations for existing environmental degradation in this state, which must be met before any new water is put under contract. The first priority for meeting new consumptive water demands should be through measures which encourage conservation of water already in use. As discussed in the preceding section, EDF believes that the best way to achieve this goal is through aggressive promotion of water transfers. The Bureau's role should shift away from that of a water seller to that of a water transfer facilitator. The Bureau should actively encourage the transfer of water from existing uses as a means of meeting new demands, and should work with its contractors, local water agencies, and state agencies to help identify opportunities for transfers and to facilitate their implementation. As the operator of major conveyance facilities the Bureau would have an important role in providing the physical means to transfer water from existing to new users.

Question 2: What opportunities exist for mutually beneficial cooperation between California's environmental and water development interests that have not been fully taken advantage of?

The answer to this question has been implied in previous discussion. The large opportunity for water transfers has not begun to be tapped. Because transfers can provide benefits to all water interests, they should be the top priority for environmental interests, as well as consumptive water users. Environmental interests must recognize that there are legitimate needs for agricultural, urban, and other consumptive uses in the state, and that the pressure to meet these demands will continue. Consumptive water users must recognize that past water development has resulted in substantial environmental degradation, a trend which must be reversed. Freer water transfers provide a positive incentive to increase water use efficiency and are the best approach to increasing the overall availability of water for all purposes.

EDF has also in the past expressed support for, or a willingness to discuss, water management approaches and projects which would shift water diversion and storage to wetter years, when water supplies are relatively abundant, and away from dry years when there is the most pressing need for increased allocations to environmental uses. Examples are the potential for off-stream surface storage, such as the proposed Los Banos Grandes and Los Vaqueros Reservoirs, and for conjunctive use of surface and ground water supplies, such as the Kern Water Bank and the Arvin Edison/MWD exchange. Such projects must be carried out in a way which provides true environmental benefits, however, and can not be used simply as a means for increasing overall diversions. Moreover, Bureau participation in any such projects developed by state or local agencies must be premised upon a commitment to environmental protection and enhancement.

Question 3: How might the Bureau of Reclamation foster mutually beneficial cooperation between California's environmental and water development interests?

To a large extent this question has been addressed in previous discussion and answers. Fostering mutually beneficial cooperation among California's competing water interests will require innovative approaches to water management designed to increase the efficiency with which water is used, thereby decreasing the competition for existing supplies. This goal can best be achieved by providing positive incentives to water users to create new water supplies through conservation or reductions in their existing use. Mutual cooperation will not be achieved if the Bureau continues to view its primary mission as putting yet more water under contract.

EXHIBIT 1

OPINION

Marketing Delta water to save some for the fish

John W. Krauthraemer is a senior attorney with the Environment Defense Fund.

By John W. Krautkraemer

THE FISH and wildlife of the San Francisco Bay/Sacramento-San Joaquin Delta estuary are in trouble. Populations of striped bass and wild salmon are only a fraction of what they were just a few decades ago, and many other fish and wildlife species are either in decline or seriously threatened. A principal cause of this decline is the diversion of freshwater for agricultural and urban use. If the decline is to be halted, much less reversed, additional fresh water must be provided for the estuary.

Unfortunately, the state Water Resources Control Board, the agency charged with ensuring that the Bay and Delta receive adequate flows, has abandoned its charge. Facing political pressure from water developers, the water board recently withdrew a draft proposal for increasing springtime flows for Delta fisheries. The draft, while flawed in several important respects, including especially its failure to contain specific flow guarantees for San Francisco Bay, was nonetheless a partial recognition that the existing allocation of fresh water for the Bay and Delta is woefully inadequate. The board's hasty retreat from even the modest improvements of its draft proposal leaves the ailing estuary with a gloomy future.

What's at stake if action is not taken soon to increase flows to the Bay/Delta system? The answer is plenty — both in terms of impacts on fish and wildlife and losses to economic interests, such as commercial and sport fisheries, tourism, recreation and even real estate. During hearings leading to the water board's ill-fated proposal, environmental organizations and state and federal agencies with the responsibility for protecting fish and wildlife presented abundant evidence on the importance of freshwater flow throughout the estuary. High flows are needed to maintain adequate food supplies in Suisun Bay — an important nursery area for young striped bass and other fish — as well as in San Pablo Bay and South Bay. They help young salmon migrate out to sea and benefit adult shad returning to the rivers upstream of the estuary to spawn. They are important in maintaining proper salinities in Suisun Marsh, home to a wide range of wildfowl and plants, including several rare species. And they play a necessary role — along with better control of pollutant discharges — in reducing toxic contamination in South San Francisco Bay.

The California Department of Fish and Game has found that in the San Francisco Bay, many species of fish prosper under good outflow conditions — not just those species that thrive in estuarine conditions (those dependent on the mix of water from rivers and the ocean) and those species that migrate between the ocean and rivers. But, somewhat surprisingly, high freshwater flows are also preferred by some marine species that can tolerate saltier conditions. Indeed, only a very few marine species actually do better when flows to the Bay are low. This suggests that flows play an important role in the overall health of the estuary and that losses in fish populations dependent on freshwater flow will not be compensated for by increases in more salt-tolerant species.

In an average year, more than half of the fresh water that would otherwise reach San Francisco Bay is stored or diverted upstream or exported out of the Delta. Diversions are even greater in drought years and in the spring, when flows are most critical for fish and wildlife. In the spring of drought years, as much as 85 percent of available fresh water is diverted, leaving the Bay/Delta estuary with only a meager share of already low flows.

THE EFFECT of these low flows is predictable. The population of striped bass, designated by the water board in 1978 as the indicator of the health of the Bay/Delta fishery, has been at extremely low levels since the 1976-77 drought. Last year, after a second consecutive drought year, the population of young bass was the lowest on record. Salmon populations are also reduced from the high levels of the 1950s and 1960s and are maintained only by heavy reliance on hatcheries, which pose genetic and disease risks to the health of the fishery. And the evidence is mounting that less well-studied species are also in decline. The population of Delta smelt, a species found only in the Bay/Delta estuary, is so low that it could well become extinct unless immediate action is taken to provide flows adequate to maintain good habitat.

Water users say that increased flows are unnecessary, but their evidence is not convincing. An example is their so-called "tule theory," which speculates that vast tule marshes and other vegetation in the Central Valley once consumed as much water as is now diverted and used for agriculture and other uses. But they have greatly exaggerated the amount of water these marshes once consumed. And in any case their own tule data suggest that vital late spring and summer flows into the Bay were probably *higher* under natural conditions than is often estimated, because the marshes of the Central Valley would store winter precipitation and release it slowly later in the year.

They also argue that actual outflow has not declined over the last 60 years, but that ignores seasonal and dry-year impacts. By looking only at 10-year annual averages, which in recent years have been heavily influenced by a few years of extremely high outflow, such as in 1982 and 1983, they mask the large reductions that have occurred in the numerous dry years since 1976.

Fortunately, there is a way to help meet the needs of the Bay/Delta estuary while also meeting the legitimate needs of other water users. Greater reliance on free water marketing — the sale or other transfer of water from an existing user to a new user — would encourage more efficient use of our limited water supplies. The way water in California is allocated now has little to do with the value of the use to which the water is put. The right to use water is usually derived either from an allocation system that gives the first user a priority over later users, regardless of the use to which the water is put, or from contracts with federal and state water projects, which are not based on sound economic planning.

WATER MARKETING would help the Bay and Delta in two ways. First, it would eliminate the need for new diversions from the Bay/Delta system. New demand would be met by transfers of water from current users, with the latter realizing a profit for conserving water or forgoing its use. And second, if the water board were to dedicate a larger share of available water to the Bay and Delta, freer water marketing would ensure that the remaining supply would be allocated most efficiently. Water marketing thus provides a means — virtually ignored by the water board in its draft proposal — to avoid or minimize any adverse impacts on existing water users from shifting more water to the Bay/Delta estuary.

Special to The Bee

OPINION

Los Angeles Times

Editorials/Analysis/Comment

Sunday, July 3, 1988

Part V

Fisheries at Risk if More Delta Water Diverted

By Peter B. Moyle and Bruce Herbold

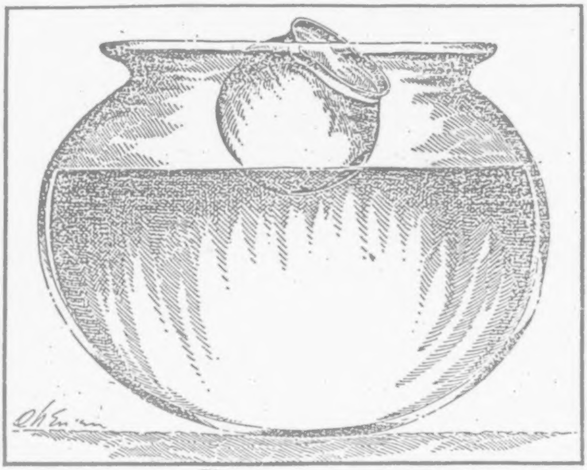
DAVIS, CALIF.

Important fishing grounds in Northern California are dwindling to insignificance because water is being diverted from the Sacramento and San Joaquin rivers, worsening water quality from the Delta to the Golden Gate. The State Water Resources Control Board, in hearings begun last year and continuing until 1989, will determine if even more water should be diverted from the estuary. The hearings are vastly important to the entire state, because they will decide how to divide—among competing factions—nearly half of all the flowing water in California. The remaining water is supposed to support the fisheries.

When the hearings are over, it is likely that the water contractors will get their way; more water will be sent south, some to urban areas but most to a few huge corporate farms in the San Joaquin Valley. This increased diversion of water will cause the environmental quality of the Sacramento-San Joaquin estuary to decline even more rapidly.

If diversions increase, we will lose much of our wild salmon, striped bass, steelhead, American shad and sturgeon populations, and eliminate a number of unique fish and invertebrate species. The declines of these species are already under way; to reverse the trends we will need more water, not less, flowing through the estuary.

For the estuary to support its important fisheries, there must be extensive shallow areas where salt water mixes with freshwater. Such areas are immensely productive of the small organisms that form the base of the food chains leading to fish. Most important, they are the nursery areas for the small, helpless larvae of many fishes. In the first three weeks of life, these tiny larvae must live in a soup of food organisms; they must literally bump into their food in order to find it. If the larvae do not bump into enough food, they die of starvation.



NANCY OHANIAN / for The Times

The main place where there is enough shallow area for a productive mixing zone is Suisun Bay, below the Delta and above San Pablo Bay, in the middle reaches of the estuary. To keep the mixing zone in Suisun Bay requires large amounts of water from mid-March through July. High spring flows are also necessary to move young salmon out to sea and to provide the flooded areas some fish need for spawning. Higher flows may be needed through September as well, to bolster growth rates and survival of young fish. The exact amount of water needed for these purposes is hotly debated but there is little doubt that more is needed than is currently required by law.

> If Delta water diversions increase, we will lose much of our wild salmon, striped bass, steelhead, American shad and sturgeon populations.

What will happen to various fish species if higher outflows are not provided?

—*Salmon and steelhead.* The runs of salmon and steelhead in central California used to number in the millions. Today the runs are numbered in the thousands and two runs of chinook salmon are being considered for endangered status. One major factor contributing to this decline is the loss of young salmon as they pass through the estuary. When outflows are high, the salmon move through quickly and thereby avoid predators, such as striped bass. When outflows are low, most of the young salmon do not make it out to sea, so fewer are harvested or make it back to spawn.

If adequate flow standards are not adopted, salmon and steelhead will dwin-

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dle to small remnant runs maintained by hatcheries at considerable expense.

—*Striped bass.* These East Coast fish became established in 1871 when a few hundred were thrown into the Sacramento River. Within a few years, more than 1 million pounds were being harvested annually; it became one of California's most popular sport fisheries.

As water development proceeded, however, the bass populations declined. Recently the decline has been drastic. The exact cause has been much debated but it is clearly tied to reduced outflows. If current trends continue, a limited fishery for striped bass will depend on rearing bass in hatcheries for their first year of life. Natural reproduction will cease to be a significant contributor to the fishery.

—*American shad.* These fish were introduced about the same time as striped bass and their history and requirements are very similar. There is a strong relationship between the success of shad reproduction and the amount of outflow.

—*White sturgeon.* Sturgeon complete their entire life cycle in the estuary, moving up into the main rivers only for spawning. In the past they have suffered severe declines from overfishing and perhaps accumulation of toxins. In recent years, however, they appear to have increased in numbers and catches of 100-to-200-pound fish are common.

Sturgeon may have bucked the declining trends of other fishes because they live so long that they can take advantage of good spawning conditions, even if they only occur once in a decade. Sturgeon populations will take a long time to respond to changes in the estuary, but eventually they will decline, as successful spawning becomes less frequent. Hatchery rearing may become necessary.

—*Native non-game fishes.* California has a rich heritage of unique native fish. Many occur in the Sacramento-San Joaquin estuary; two occur *only* there: Delta smelt and Sacramento splittail.

The Delta smelt are small fish that feed on plankton throughout their lives. Like striped bass, they depend on high outflows to provide sufficient food for their young. Smelt live only one or two years, spawn and die. In recent years, their numbers have declined precipitously and there is a possibility of having them declared an endangered species.

Splittail are not in such immediate danger, but their success also depends on high outflows, in part because they spawn on flooded vegetation.

—*Opossum shrimp.* This small shrimp is the most important food in the estuary for fishes 4 to 10 inches long, including striped bass, splittail and sturgeon. Its populations are highest when outflows keep the mixing zone in Suisun Bay for extended periods, where the shrimp feeds on smaller organisms.

Under a regime of consistently low outflows, the populations of opossum shrimp will decline to insignificance, hastening the decline of fishes that depend on them. Low shrimp populations will limit the success of hatchery programs that release small fish.

This scenario of decline and extinction may seem oversimplified and unduly pessimistic, but it is realistic. History is on our side: Virtually every major water project in the West has been justified in part by its benefits to fisheries; with a few notable exceptions, they have had just the opposite effect.

Millions have been spent attempting to mitigate the effects of dams on salmon populations in California and yet the populations continue to decline. California contains more endangered or extinct fishes than any other state, mostly because water projects have taken or altered the water the fish needed to survive.

It is too late to undo much of the damage to our fisheries, but before we continue with further water development, we should know its *real* costs, both biological and economic. In the Sacramento-San Joaquin estuary, expanded water exports means elimination of major fisheries and unique native species. There is more than enough water available now to satisfy California's agricultural, industrial and urban needs without devastating fish and fisheries—provided we are willing to alter drastically the ways we use, deliver and market water.

California's leaders and voters must become wise enough to realize this and not let another large—and valuable—piece of our natural heritage disappear. □

Monday, December 28, 1987

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EDITORIALS

Saving Water To Save the Bay

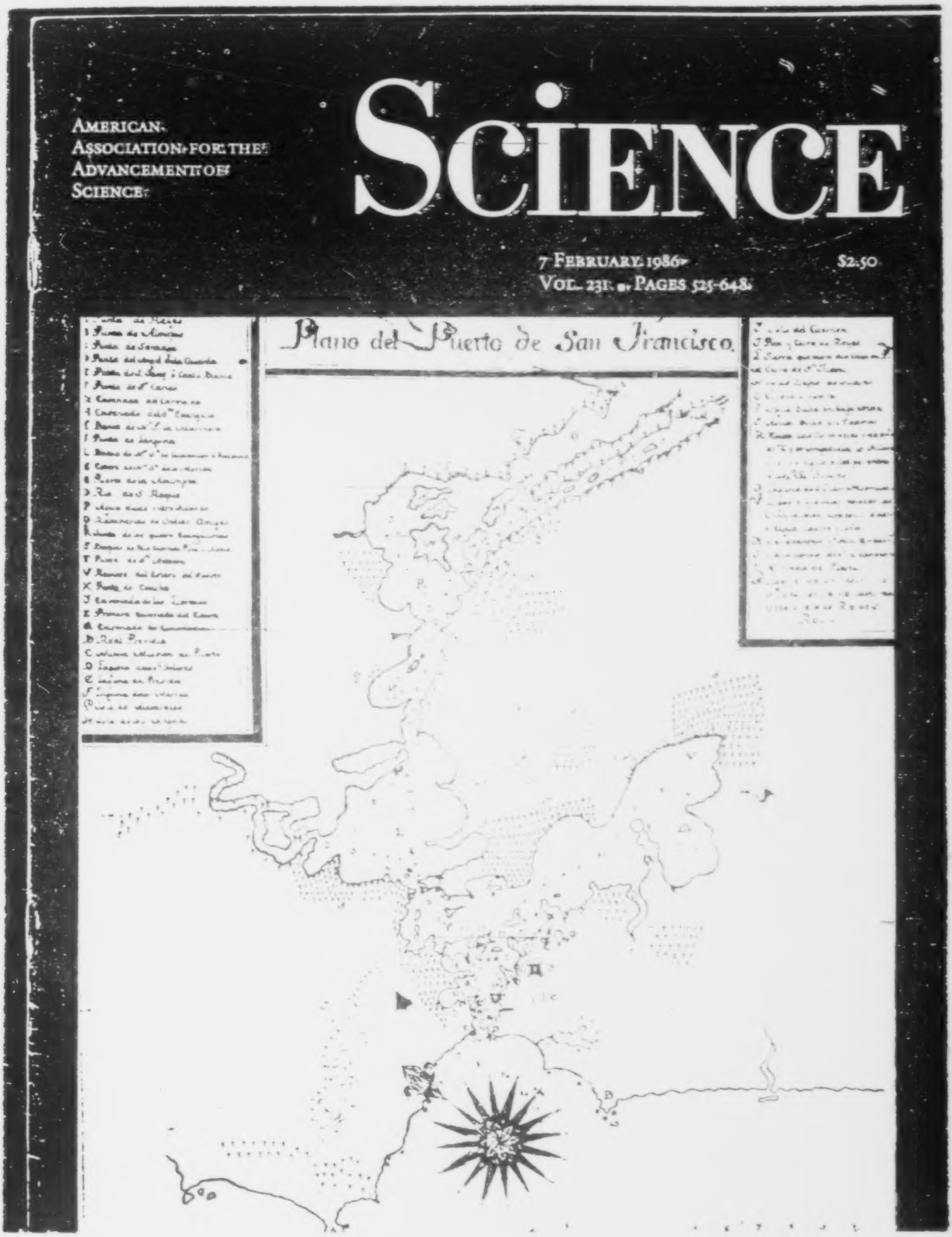
SOUTHERN CALIFORNIA politicians and water agencies have an insatiable thirst for more and more exports of fresh water from Northern California rivers. We hope that both politicians and agency officials were paying attention the other day when the Environmental Defense Fund presented its studies of the amount of fresh water required to preserve, if not enhance, San Francisco Bay, the Suisun Marsh and the Sacramento-San Joaquin Delta system. The recommendations were given to the state Water Resources Control Board, which is winding up the first year of a three-year program to determine what is required to assure water quality in the bay and its immediate fresh water sources.

The environmental fund's hydrology expert, Dr. Philip Williams, has found that the bay-marsh-delta areas need some five-to-six million more acre feet of fresh water inflow than they now receive. So much for those who contend that Northern California fresh water resources are infinite and may be exported until the rivers run dry.

Dr. Williams set his standards for fresh water flows into the bay with four objectives in mind. He wants sufficient fresh water to protect the estuarine ecosystem and maintain its food supply, phytoplankton). He wants adequate river water going to the Suisun Marsh wetlands. He asks sufficient water to help migratory young salmon as they start their trips to the ocean. And he wants enough water to insure the survival of striped bass.

"EDF (THE DEFENSE FUND) believes that the current allocation of water between the bay and delta on the one hand and consumptive users of water on the other is totally out of balance with the scale strongly tipped against the estuary," the group said.

Balance between Northern California environmental and ecological need and Southern California's desire for unrestricted growth must, of course, be restored. The Environmental Defense Fund suggests, and we wholeheartedly agree, that there should be more efficient use of water resources already available to all water development agencies. Those who would build more and more dams have given little respect, even in recent years, to simple conservation measures. And EDF says, aggressive promotion of the free marketing of water would result in its more efficient uses.



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The Modification of an Estuary

FREDERIC H. NICHOLS, JAMES E. CLOERN, SAMUEL N. LUOMA,
DAVID H. PETERSON

The San Francisco Bay estuary has been rapidly modified by human activity. Diking and filling of most of its wetlands have eliminated habitats for fish and waterfowl; the introduction of exotic species has transformed the composition of its aquatic communities; reduction of freshwater inflow by more than half has changed the dynamics of its plant and animal communities; and wastes have contaminated its sediments and organisms. Continued disposal of toxic wastes, the probable further reduction in freshwater inflow, and the possible synergy between the two provide the potential for further alteration of the estuary's water quality and biotic communities.

ESTUARIES HAVE LONG BEEN A FOCUS OF HUMAN SETTLEment and activity because of their wide array of living and nonliving resources. They have also been susceptible to change: their tributary rivers have been dammed and diverted, shorelines modified, fish populations reduced or eliminated, and water quality altered by wastes (*1*). The San Francisco Bay estuary is no exception.

San Francisco Bay is located at the mouth of the Sacramento–San Joaquin river system, which carries runoff from 40 percent (153,000 km^2) of California's surface area (Fig. 1). Spanish soldiers and missionaries, first arriving in 1769, found here a complex of bays and marshes where an estimated 10,000 to 20,000 aboriginals lived and harvested food (*2*, *3*). The Spanish settlement (now San Francisco) remained an isolated trading outpost until gold was discovered in the Sierra Nevada foothills (Fig. 1) in 1848. Within 2 years, San Francisco's population grew from 400 to 25,000, beginning the California population boom.

The estuary changed as well. By 1900 the surface area and depth of the bay had decreased, marshes were nearly gone, fresh water was being diverted for irrigation, many exotic plants and animals (including pest species) had been introduced, and the effects of sewage were already apparent. With respect to diversity of change, San Francisco Bay is today considered the major estuary in the United States most modified by human activity (*4*).

In this article we describe some of the human activities occurring in the San Francisco Bay estuary and its watershed since 1850 that have resulted in physical, chemical, and biological changes.

Early Ecological Changes

Fish and wildlife. The best documented change that occurred in San Francisco Bay after the Gold Rush was a decline in fish abundances (*5*). Early immigrants exploited the waterfowl, fish, and shellfish of the bay and the Delta—the low-lying region of marshes, islands, and channels surrounding the confluence of the Sacramento and San Joaquin rivers (Figs. 1 and 2).

Commercial fisheries in salmon, sturgeon, sardines, flatfish, crabs, and shrimp were quickly established. However, by 1900 catches of larger, longer lived species at upper trophic levels, such as salmon, sturgeon, and the introduced striped bass, had declined; gradually, these commercial fisheries were halted to protect the stocks for sports fishing (*5*). Declining abundance of the Dungeness crab *(Cancer magister)* in the bay forced that fishery to move offshore in the 1880's, although the bay remained a nursery ground until the 1960's, when the nearby offshore fishery collapsed (*6*). Today's commercial fishing is restricted to herring and anchovies (*7*, *8*), species representative of the smaller, more rapid reproducers at lower trophic levels that dominate the fisheries of disturbed environments elsewhere (*9*). The shifts in San Francisco Bay fisheries presumably have resulted from a combination of overfishing, elimination of essential habitats, and changes in water quality (*5*), whereas the decline of the offshore crab fishery since 1960 is attributed variously to increased ocean temperature, predation by hatchery-reared salmon, and pollution (*6*). The specific contribution of any of these factors to the decline of individual species has not been quantitatively determined.

Introduced species. A less obvious but equally important change occurred within the communities of plants and animals representing the lower levels of the estuarine food web. Upon completion of the transcontinental railroad in 1869, large quantities (up to 100 carloads per year) of live eastern oysters *(Crassostrea virginica)* were shipped from the East Coast to California for maturing on coastal bay mud flats. By the late 1890's the imported oyster was California's most valuable fishery product (*10*).

Although the eastern oyster never became naturalized in San Francisco Bay (transplanted adults failed to produce young), other East Coast invertebrates, unintentionally shipped with the oyster, became fully established (Fig. 3). Additional species that had bored into ship hulls or were carried in ship ballast were also released into the bay (*7*). In total, approximately 100 invertebrate species were introduced, including the only two mollusk species in today's bay sports fishery [the eastern soft-shelled clam (*Mya arenaria*) and the Japanese little-neck clam *(Tapes japonica)*] and pest species [such as the oyster drill *(Urosalpinx cinerea)* and the shipworm *(Teredo navalis)*, the latter causing large-scale destruction of piers and bridges soon after its introduction (*11*)]. Now, nearly all common macroinvertebrates present on the inner shallows of the bay, and some planktonic invertebrates and algae, are introduced species (*7*, *12*, *13*). The remarkable success of the introduced invertebrates has been attributed to (i) the lack of a diverse native fauna because of the estuary's geologic youth and geographic isolation (*7*) and (ii) the

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opportunistic characteristics of many of the introduced species that made them well suited to rapidly colonize the bay's underexploited habitats (*12*).

Fish species were intentionally introduced beginning in the 1870's (*5*). Of the 42 fish species now inhabiting the sloughs of Suisun Bay marshes (Fig. 2), for example, 20 are introduced (*14*). The striped bass *(Morone saxatilis)*, introduced from the East Coast in 1879, yielded annual catches exceeding 450 tons between 1889 and 1915. Catches declined thereafter, and commercial fishing was prohibited in 1935. The striped bass remains the primary sports fishery in San Francisco Bay (*5, 7*).

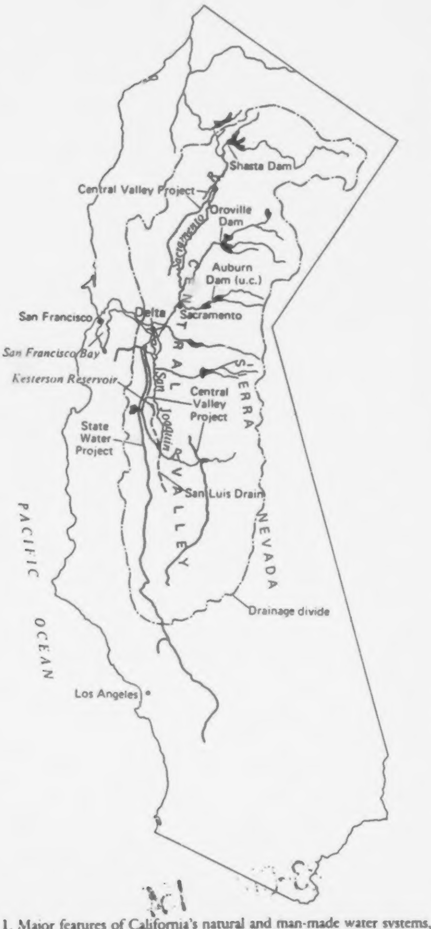


Fig. 1. Major features of California's natural and man-made water systems, including the drainage basin and major tributaries (fine lines) of the Sacramento and San Joaquin river system, major storage reservoirs (black areas), aqueducts (bold lines), the Central Valley (shaded area), the Delta, and the San Francisco Bay estuary.

Physiographic Alterations

The character of the central California landscape changed during the late 1800's as a result of the gold mining, farming, and land development that accompanied the explosive growth of population centers. Hydraulic gold mining and land reclamation resulted in particularly marked physical changes to San Francisco Bay.

Hydraulic mining debris. Hydraulic mining (the use of water under high pressure to expose ore deposits, employed from 1853 to 1884) greatly accelerated the recovery of gold from the Sierra Nevada. In the process, tens of millions of cubic meters of rock and earth were excavated annually. This debris choked creeks and rivers, silted or blocked salmon spawning streams, and obstructed navigation throughout the drainage basin (*15*). The obstructed river channels could not contain winter and spring runoff, and periodic massive flooding resulted (*15, 16*). Hydraulic mining was stopped by court injunction in 1884, but decades of winter floods and dredging were required to flush the sediments from the river channels. The Sacramento River channel did not return to its pre-mining depths until the late 1920's (*11*).

Although most damage from hydraulic mining debris occurred in the drainage basin of the Sacramento and San Joaquin rivers, much of the mud and sand reached San Francisco Bay. By the end of the 19th century, 1.0, 0.75, and 0.25 m of sediment was deposited in Suisun, San Pablo, and central San Francisco bays (Fig. 2), respectively (*15*). Acceleration of the natural sedimentation process contributed to both a permanent reduction in the open-water area of the bay through shoaling and an expansion of marshland across some of the newly formed mudflats (*7*). The reformed bottom topography reduced the water volume of the bay and altered tidal circulation patterns (*15*). No record exists of short- or long-term effects of these changes on the bay's biological communities, although oyster beds were reported to have been harmed by heavy siltation during the mining period (*10*).

Land reclamation. Before 1850, 1400 km^2 of freshwater marsh surrounded the confluence of the Sacramento and San Joaquin rivers, and another 800 km^2 of saltwater marsh fringed the bay's shores (Fig. 2) (*15*). As population increased, tidal marshes were diked to create farmland (primarily in the delta), evaporation ponds for salt, and, later, residential and industrial land. Reclamation of freshwater marshlands in the Delta was essentially complete by the early 1920's, but filling of the bay's saltwater marshes continued into the early 1970's (*8*). Of the original 2200 km^2 of tidal marsh, only about 125 km^2 of undiked marsh remains today (Fig. 2) (*7*). Long-term effects of marshland elimination on estuarine water chemistry and productivity are possible (*17*), but, again, no appropriate records predating these changes exist. Nonetheless, because half of the migratory birds on the Pacific Flyway winter on or near San Francisco Bay (*18*), we assume that the loss of food and habitat provided by the bay's former marshes has been detrimental to these bird populations.

Water Development and Altered Freshwater Inflow

California's climate consists of a wet winter (November through April) and a dry summer (May through October). The absence of summer rainfall necessitates irrigation of Central Valley farmlands with water diverted from the Sacramento or San Joaquin rivers and their tributaries. Further, because about 70 percent of the state's annual runoff occurs north of Sacramento (Fig. 1) and 80 percent of water consumption occurs south of that city (*19*), increased management of the water that flows toward San Francisco Bay has accompanied the state's growth (*16*). One result has been a greatly reduced freshwater flow into the estuary.

The Sacramento and San Joaquin rivers discharged about 34 km^3 of fresh water into San Francisco Bay annually before 1850 (*20*). As California's population grew (Fig. 4A), the area under irrigation increased by about 30,000 ha per year (Fig. 4B), creating demands for both flood protection and reliable water supplies. In response, state and federal agencies built dams, reservoirs, and canals to increase storage capacity (Fig. 4C) and annual export rates (Fig. 4D). These facilities represent the world's largest man-made water system (Fig. 1), with a water-storage capacity of about 20 km^3 (*16*). At present, nearly 40 percent of the historic (1850) flow of the Sacramento–San Joaquin river system is removed for local consumption upstream and within the Delta. Another 24 percent is pumped from the Delta and exported in aqueducts for agricultural and municipal consumption in central and southern California (Fig. 5). Now, the flow into San Francisco Bay is less than 40 percent of historic levels. To minimize up-estuary salt intrusion that results from lowered freshwater flows (and that is exacerbated by dredged channel deepening between San Pablo Bay and the Delta) (*11*), inflow during summer has been increasingly augmented (Fig. 6).

Nearly 86 percent of California's managed water supply is used in agriculture (*21*). If the state's reservoir capacity increases as projected (Fig. 4C) and conversion of arid land to new farmland through irrigation continues to be profitable, demands for water export will increase (Fig. 4D). As a result, average freshwater inflow to the bay in the year 2000 is projected to drop to 30 percent of the historic average (Fig. 5).

Ecological consequences of reduced river inflow. Both the physical process of diverting water and the changes in flow patterns resulting from water management have affected biological communities of the San Francisco Bay estuary. Disruption of the natural flow of water has most noticeably affected migratory fish—species dependent on the rivers for spawning. Construction of Shasta Dam (Fig. 1) in 1944 eliminated half of the salmonid spawning habitat in the Sacramento River system (*5*), requiring the augmentation of natural stocks with hatchery-reared fish. The operation of water diversion pumps at the southern end of the Delta during summer periods of low river flow causes water in Delta channels to flow upstream. Thus, hundreds of millions of juvenile salmon and striped bass (31 and 25 percent of typical year classes, respectively) are drawn into the water diversion pumps each year (*22*). Equal numbers are lost to numerous small siphons and pumps that collect irrigation water for local consumption in the Delta (*23*). These losses have contributed to a decline in the abundance of adult striped bass to less than 25 percent of that in the mid-1960's (*24*).

Effects of water diversions on the biology of the bay itself, although more difficult to identify or quantify because of simultaneous changes due to land reclamation, fishing, and waste disposal, can be deduced from observations made during two consecutive years of naturally low flows (1976 and 1977). Normally, fresh water is released during summer at a controlled rate between 100 and 400 m^3/sec (Fig. 6). Under these conditions, the downstream-flowing river currents are balanced, in Suisun Bay, by the upstream-flowing bottom currents carrying salt water (Fig. 7). This convergence, or null zone, is a point where suspended particles, including sediment and planktonic diatoms, accumulate (*7, 25, 26*). Associated with this phytoplankton maximum are high abundances of pelagic herbivores (copepods and the mysid shrimp *Neomysis mercedis*) that are important food sources for larval or juvenile fish (*27*). During 1977, when Sacramento–San Joaquin river discharge in summer dropped below 100 m^3/sec (Fig. 6), phytoplankton biomass in the upper estuary was reduced to 20 percent of normal levels (*26*), zooplankton abundance was significantly reduced, and both *Neomysis* abundance and striped bass recruitment fell to their lowest recorded levels (*27, 28*). Suppression of the pelagic food web during this natural occurrence of extremely low flow suggests that (i) production of some pelagic fishes in the upper estuary may depend on a high biomass of primary producers and (ii) high phytoplankton biomass develops only when freshwater inflow exceeds 100 m^3/sec (*26*).

Two theories have been proposed to explain the absence of a summer phytoplankton bloom in northern San Francisco Bay during extremely low inflows. The first theory (*26*) holds that the typical summer biomass maximum is dependent on a circulation pattern that positions the null zone adjacent to the productive shallows of Suisun Bay, where light availability is sufficient to sustain algal growth. When river discharge falls below 100 m^3/sec, the null zone moves upstream into the deeper Sacramento River, where light availability is insufficient to sustain net photosynthesis and phytoplankton biomass remains low. The second theory (*29*) holds that reduced phytoplankton biomass during periods of persistent low river flow and high salinity results from increased grazing losses to immigrant benthic suspension feeders that are normally excluded from this region by winter freshets.

Both mechanisms, direct consequences of reduced freshwater inflow, probably contributed to the absence of a summer bloom during the 1977 drought. These findings illustrate the sensitivity of northern San Francisco Bay biological communities to persistent low river flow and suggest that further reductions in freshwater inflow (Fig. 5) could permanently alter the pelagic food web and fisheries yield there.

Other consequences of reduced inflow. Reduced freshwater inflow from the Sacramento–San Joaquin river system may also reduce the estuary's capacity to dilute, transform, or flush contaminants that are discharged into San Francisco Bay. Estimated residence time of water in northern San Francisco Bay ranges from a minimum of 1

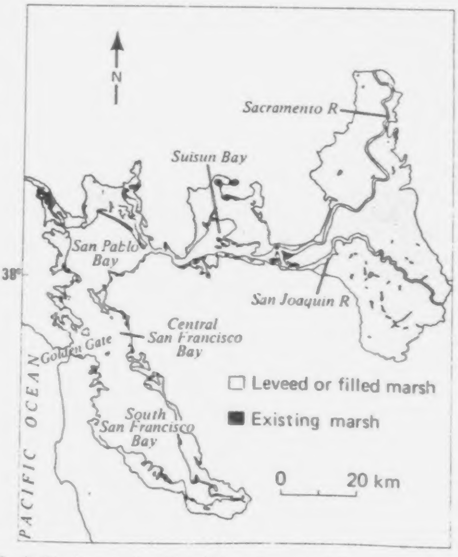


Fig. 2. Distribution of undiked tidal marshes around San Francisco Bay before 1850 and at present (*7*).

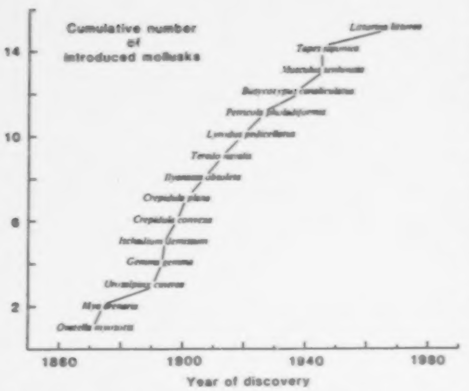
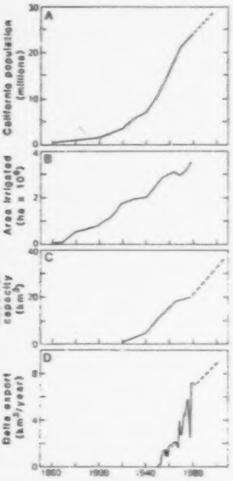


Fig. 3. Cumulative number of introduced mollusks by date of discovery (7). The period of most rapid increase, the 1890's, coincides with the period of maximum oyster importation.



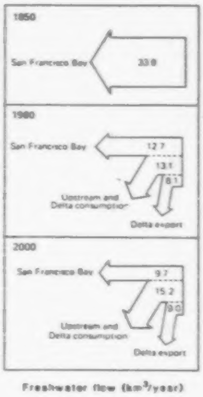


Fig. 4 (left). (A and B) California population growth and land under irrigation (50); (C) water storage capacity of reservoirs in the Sacramento and San Joaquin river basin exclusive of those smaller than 8000 ha (dashed line represents an estimated increase of 15.2 km^3 in the year 2005 for the Auburn Reservoir now under construction and the proposed increased height of Shasta Dam) (51); (D) historic and projected export of water from the delta by the federal Central Valley and state water projects (19, 52). The effect of the 1976–77 drought on Delta export is clearly seen. Fig. 5 (right). Disposition of Central Valley runoff (exclusive of transpiration and other natural losses) before about 1850, in 1980, and projected for the year 2000. Water removed in the watershed and within the delta for local irrigation and domestic consumption is shown as upstream and delta consumption; that withdrawn from the Delta for export to central and southern California is shown as Delta export (19, 20).

day during peak winter flows to a maximum of 2 months during sustained low summer flows (30). Winter peaks in river inflow also carry fresh water into the semienclosed embayment of South San Francisco Bay (hereafter called South Bay) (Fig. 2), which has no other important source of freshwater inflow. In the process, salinity of South Bay drops from about 30 to 15 per mil (well below that of seawater at the Golden Gate). The resulting horizontal water-density gradient causes the fresher surface layer to move seaward and more saline bottom water to move landward (30, 31). This increase (up to tenfold) of nontidal currents following periods of high river discharge accelerates the exchange of water between South Bay and Central Bay, decreasing water residence time in South Bay from several months to several weeks (30).

Changes in circulation that accompany freshwater intrusion into South Bay apparently affect concentrations of dissolved constituents, including trace contaminants. Silver and copper concentrations in benthic organisms near a waste outfall in South Bay decrease after winter floods, when salinity drops (30). Moreover, less silver accumulates in the organisms during years of highest freshwater inflow in winter (Fig. 8). Although mechanisms are not well understood, such evidence suggests that (i) concentrations of biologically available metals may be linked to the river-driven circulation of South Bay and (ii) a significant reduction of river inflow could reduce the effectiveness of processes that facilitate waste assimilation in South Bay.

Waste Disposal

Wastes from municipal and industrial outfalls and in runoff from urban and agricultural lands have flowed into the estuary since the Gold Rush. Nonetheless, determining their effects on the bay's aquatic life has been difficult.

Agricultural waste. Beginning in the late 1940's, use of fertilizers, soil amendments, herbicides, and pesticides in Central Valley farmlands became widespread and altered the composition of river water, most notably in the San Joaquin River. The San Joaquin River Valley is arid, with a discharge per unit area about one-third that of the Sacramento River Valley. Agricultural waste water (residual irrigation water, containing salts leached from the soil, that is returned to the river in subsurface pipe drainage systems) makes up more than 20 percent of the total San Joaquin River flow (32). Maximum annual concentrations of sulfate and nitrate in the river, normally occurring during the irrigation season, have increased nearly threefold and fivefold, respectively, since 1950 (Fig. 9). The increases reflect, in large part, expanding irrigation of soils containing natural sources of gypsum ($CaSO_4 \cdot 2H_2O$) and the addition of fertilizers as well as gypsum and other forms of sulfate as soil amendments.

To dispose of the increasing volume of agricultural waste water (including water used to flush salts from salinated soils), an artificial channel connecting the Central Valley with San Francisco Bay near Suisun Bay—the San Luis Drain (Fig. 1)—was authorized for construction by Congress in 1960 (33). As proposed, the drain would discharge natural and agriculture-related chemicals into the bay, including an estimated 17 tons of nitrogen per day (34), a rate equal to that from all point sources north of San Francisco (7).

A portion of the San Luis Drain that serves about 3000 ha of farmland (less than 10 percent of the area proposed to be served) was constructed. In 1978 drain water began to flow into a temporary holding facility, the Kesterson Reservoir—a marshy lowland used also as a wildlife refuge (33). In 1982 dying vegetation and declining wildlife abundances were noted in the reservoir. A year later, unusually high incidences of physical deformities, reproductive failure, and mortality were observed in aquatic birds using the reservoir: greater than 40 percent of nests contained at least one dead embryo and 20 percent contained at least one embryo with obvious external abnormalities (*35*). Subsequent chemical analyses of animal and plant tissues taken from reservoir populations showed mean selenium concentrations ranging from 22 to 175 μg/g (dry weight), or up to 130 times those found at a nearby control site (*35*). Samples of waste water from the San Luis Drain and the Kesterson Reservoir also contained very high selenium levels (140 to 1400 μg/liter) (*36*).

Selenium, occurring naturally in alluvial soils of the arid western San Joaquin Valley, is leached by irrigation water and concentrated, with other salts, in the topsoil by evaporation. The selenium is mobilized when the soils are drained to remove all accumulated salts and is carried into the reservoir. There, it causes the reproductive failures and deformities in resident birds (*33, 35*).

The discovery of bird mortalities and deformities in the Kesterson Reservoir has resulted in recent state and federal decisions to halt work on the San Luis Drain project and to close the reservoir in 1986. In the meantime, agricultural waste water from west San Joaquin Valley farmlands not served by the existing San Luis Drain continues to flow into the San Joaquin River. High concentrations of selenium have recently been found in ducks in South Bay (*37*). Whether the selenium originates in the San Joaquin River or from local sources in the bay area remains to be determined.

Domestic and industrial waste. Significant changes in the composition of bay waters have occurred because of the urbanization and industrialization of the bay's shore. At present, industrial and domestic wastes, as well as urban runoff, enter the bay at more than 100 locations. The known point sources of waste include more than 30 municipal and 40 industrial waste treatment facilities and an additional 100 smaller industrial dischargers. Together, these facilities discharged 0.7 km^3 of waste water in 1978, or nearly 4 percent of the average annual freshwater inflow to the bay. The annual waste input contains, among numerous constituents, 300 metric tons of trace metals (*38*). The ratio of wastewater to freshwater inflow is expected to double by the year 2000 (*8*). Untreated urban runoff also enters the bay through more than 50 small local streams because most runoff and sewage systems are separated. Additional contamination results from daily accidental spills of industrial chemicals and oil; small oil spills alone account for 200 to 300 spills annually (*8*).

Adverse ecological effects of waste discharge have been suspected since the early 1900's, when industrial wastes were implicated in the gradual failure of the oyster industry (*2, 5*). A detailed analysis of pollution effects was not undertaken until 1951, when a study showed that (i) few or no benthic invertebrates were present immediately adjacent to several waste outfalls, (ii) the number of species nearby was depressed below area averages, and (iii) industrial wastes suppressed the number of species more than did domestic wastes (*39*).

Improvements in sewage treatment facilities beginning in the 1960's reduced some of the adverse effects of wastes. Concentrations of oxygen-consuming organic matter and ammonia in South Bay have been reduced to the point that the summer depletion of dissolved oxygen, typical two to three decades ago, no longer occurs (*8*). Summer concentrations of enteric bacteria have declined in South Bay from 800 per 100 ml of water in 1964 to 4 per 100 ml in 1977 (*38, 40*). Collection of shellfish for human consumption, banned for decades, has recently been permitted during summer on selected mud flats well removed from outfalls or other sources of hazardous waste.

Despite greatly upgraded sewage treatment, bay sediments and organisms are contaminated to various degrees with trace organic and inorganic materials. Average concentrations of trace metals in bay organisms, when compared with averages in organisms from other estuaries, are not especially high, reflecting the many locations in the bay unaffected by local discharges and the rapid dilution of those wastes discharged by the major cities near the mouth of the estuary. On the other hand, localized patches of metal contamination, with concentrations as high as those observed anywhere in the world, occur near past and present waste disposal sites (*8, 41*).

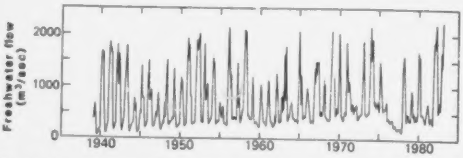


Fig. 6. Mean monthly freshwater flow in the Sacramento River at Sacramento since 1938. Note the progressive increase in the summer flow rate and the major anomaly associated with the 1976–77 drought [from T. J. Conomos *et al.*, figure 9A, in (*30*)].

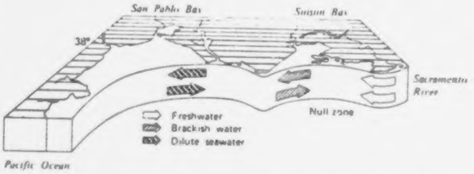
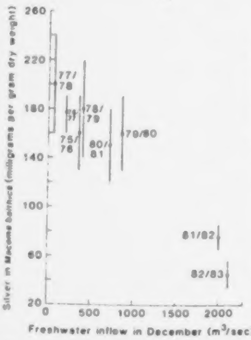


Fig. 7. Nontidal estuarine circulation and the null zone in northern San Francisco Bay. Suspended particles (stippled area) accumulate in the null zone where the upstream flow of salt water at the bottom meets the downstream flow of fresh water and net movement is minimal. This zone moves up and down the estuary in response to river discharge.



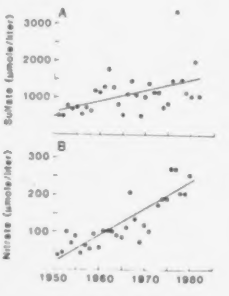


Fig. 8 (left). Maximum concentrations of silver found in the clam *Macoma balthica* living in a metal-enriched mud flat in South San Francisco Bay as a function of freshwater inflow in December [from S. N. Luoma *et al.*, figure 9, in (*30*)]. Fig. 9 (right). Maximum annual concentrations of dissolved sulfate (A) and nitrate (B) in the San Joaquin River near its mouth (*53*). Lines are least-squares regressions.

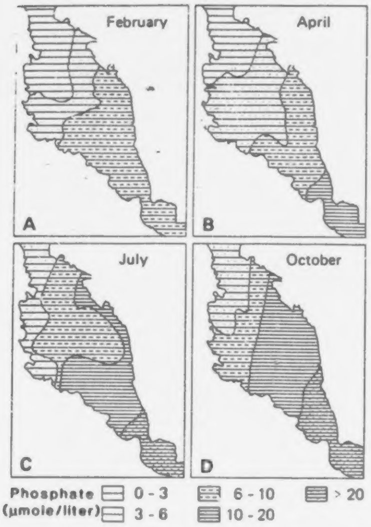


Fig. 10. Dissolved phosphate distributions in South San Francisco Bay at four times of year (*54*).

Distributions of toxic organic materials [polychlorinated biphenyls (PCB's) and petroleum hydrocarbons] are also patchy, with concentrations in some organisms reaching levels comparable to those in highly contaminated estuaries. For example, PCB concentrations observed in the blubber of bay harbor seals *(Phoca vitulina richardii)* in 1977 (*42*) equaled those concentrations thought to cause reproductive failure in Baltic Sea gray seals (*43*). Concentrations of petroleum hydrocarbons in mussels collected in central San Francisco Bay nearly equal those in Los Angeles and San Diego harbors, which are subjected to frequent petroleum contamination (*8*).

Although no studies have clearly linked trace contaminants to the permanent elimination of any species population, elevated tolerances to trace metals have been observed in the clam *Macoma balthica* and the copepod *Acartia clausi* from contaminated locations in the bay (*44*). These results imply an importance of adaptive flexibility to the survival of some populations. Studies near a South Bay sewage outfall also indicate that physiological stress caused by trace metal contamination occurs even in highly adaptable bivalves when metal availability is highest (*30*). High incidences of skin lesions, tumors, and increased parasitism in the bay's striped bass may be consequences of exposure to synthetic organic compounds; moreover, the concentrations of petroleum-derived hydrocarbons found in striped bass are as high as those that adversely affect the hatching success of eggs in the laboratory (*45*). Physiological indicators of stress in mussels transplanted along a transect in South Bay increased coincident with a gradient of increasing trace metal concentrations in water, sediment, and organisms (*46*).

Nutrient enrichment of the bay. Stimulation of plant growth through nutrient enrichment, with subsequent declines in oxygen content of the water as the plant material decomposes, is another potentially important result of waste discharge. Sewage-derived nutrient inputs in northern San Francisco Bay are not easily distinguished from the large riverine inputs. Waste-derived nutrients are more apparent in South Bay, where storm drains and waste treatment plants are the principal sources of freshwater inflow (*7*). During the winter-spring period of high river runoff, levels of nutrients [for example, phosphate (Fig. 10A); nitrate concentrations vary similarly] in South Bay are low because of dilution with low-salinity water in central San Francisco Bay (*7*). During the rest of the year, when runoff is low and dilution and mixing with central bay water diminish, nutrient levels increase (Fig. 10, B to D) to a summer-autumn maximum that is often the highest level found in San Francisco Bay.

Although nutrient concentrations are periodically high, the bay does not exhibit symptoms of eutrophication—nuisance phytoplankton blooms and associated depletion of oxygen [although localized, episodic blooms of drift macroalgae occur in some years (*30*)]. Benthic filter feeders in South Bay are apparently sufficiently abundant to reduce the standing crop of phytoplankton well below expected levels (*47*). Thus the benthos may act as a natural biological control on eutrophication—a process employed in aquaculture (*48*)—by converting sewage-derived nutrients to animal biomass. It follows, therefore, that events that selectively disturb the benthos (for example, exposure to contaminants) could promote the development of noxious blooms.

In Perspective

Few of the changes we have described are unique to San Francisco Bay. Many estuaries, such as those of the Delaware, Hudson, Potomac, Rhine, Susquehanna (Chesapeake Bay), and, until recently, Thames rivers, have seasonal or permanent oxygen depletion resulting from high organic waste loading or nutrient enrichment as well as contamination by toxic wastes (*49*). Other estuaries in arid regions around the world are also affected by river water impoundment and diversion (*4*).

Measured in terms of concerns that attract public attention or interfere with commerce, the problems of San Francisco Bay appear less severe than those of other large urbanized estuaries. This appearance results, in part, because (i) much of the urban and industrial development in the bay area has occurred near the estuary mouth, where dilution and dispersal of wastes are greatest, rather than on the tributary rivers; (ii) corrective actions taken since the 1960's have eliminated oxygen depletion and greatly reduced pathogenic bacteria; and (iii) many of the major changes (such as the disappearance of wetlands, introduction of exotic species, and loss of many commercial and sports fisheries) occurred decades ago and have been forgotten.

Despite the difficulties in measuring ongoing, human-induced changes, it is clear that San Francisco Bay is sensitive to diverse human activities. Toxic wastes derived from agricultural and industrial activities have been locally detrimental to birds and bottom-dwelling invertebrates. Suggested links between the striped bass decline and contamination with synthetic organic compounds or between physiological stress in bivalves and trace metals, although largely circumstantial, indicate that chronic regional effects of contamination exist in San Francisco Bay. There is also evidence that decreased freshwater inflow can contribute to altered balances among plant and animal communities that may lead, for example, to decreases in some fish stocks. In addition, there is an apparent link between river flow and the capacity of the estuary to assimilate wastes.

The future well-being of this estuary (like that of other urbanized estuaries) lies in achieving an increased understanding of its interacting physical, chemical, and biological processes and how these processes are affected by specific human activities. The effects of

EXHIBIT 2

ENVIRONMENTAL DEFENSE FUND

January 28, 1985

David Houston
Regional Director
U.S. Bureau of Reclamation
2800 College Way
Sacramento, California 95825

David Kennedy
Director
Department of Water Resources
P.O. Box 388
Sacramento, California 95802

RE: Coordinated Operation
Agreement

Dear Directors Houston and Kennedy:

Last July, we wrote on two issues of concern to us in the ongoing CVP-SWP coordinated operation agreement negotiations: the procedures the Bureau of Reclamation would follow if the state adopted new Delta water quality standards, and the timing of negotiations for a sale of CVP water to the SWP. A copy of our letter, dated July 31, 1984, is attached for your reference.

We are pleased that the negotiations are continuing and appreciate the efforts you have made to open these negotiations to the public. We do, however, have some continuing concerns pertaining to the same two issues addressed in our earlier letter.

Procedures for New Delta Standards

Although the Bureau and the Department have some disagreement over the specifics of the procedures governing the Bureau's compliance with new Delta standards, they now appear to be in agreement in principle on the basic outline of those procedures. Generally, the proposed procedures would require the Secretary of the Interior to decide whether, in his or her opinion, operation of the CVP in conformance with new standards would be consistent with congressional directives. If the Secretary takes the position that CVP compliance with new standards would not be consistent with congressional directives, the Bureau, in consultation with the Department, will develop a proposal for meeting the standards and will submit that proposal to Congress for enactment as legislation. In the interim (for up

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to two years after the submittal of the proposal to Congress), the Bureau will comply with the new standards, except to the extent that they prevent delivery of water under existing water contracts.

While we understand your agencies' desire to develop procedures for new Delta standards which may avoid protracted litigation every time the standards are changed, we continue to have some fundamental concerns with the approach outlined above. Our primary objection to the proposed procedures is that they do not adequately recognize the Bureau's existing legal obligation to protect water quality in the Delta and San Francisco Bay. As we pointed out in our July letter, numerous opinions on the subject confirm that the state may condition the water right permits of the CVP for salinity control and environmental protection in the Delta and Bay without any further action by Congress. While the state cannot impose requirements which are inconsistent with clear congressional directives, the Secretary's discretion to comply with state water quality standards is considerably less broad than previously conceded by the Bureau in other fora, or in the present negotiations.

In the ongoing appeal of the Decision 1485 standards, the state attorney general has argued that state law exclusively governs the acquisition and definition of water rights held by the Bureau. We agree with this position. This means that the Bureau's rights are subject to the priority under state law accorded protection of water quality in the Bay and Delta. Only if the state were to attempt to control the distribution of water from the CVP -- such as directing delivery of water in excess of federal acerage limitations -- would consistency with congressional directives even be at issue.

Given the broad authority of the state over the Bureau's water rights, the presumption should be that the state has validly exercised its authority and that the Bureau is bound by any new Delta standards. For these reasons, we would prefer procedures similar to those earlier proposed by the Department which would commit the Bureau to comply with new standards, while allowing the Bureau to seek whatever redress it deems appropriate in Congress or the courts. Under such a procedure it would be clear that congressional inaction would not allow the Bureau to ignore state standards. In addition, before challenging state standards in the courts or in Congress, the Bureau should be required to attempt to resolve its concerns with the Department and other pertinent state and federal agencies, including EPA, the Fish and Wildlife Service and the National Marine Fisheries Service.

Assuming that procedures such as those currently proposed are adopted, however, we are also opposed to any provision giving priority to Delta exports over protection of Bay and Delta water quality during the pendency of congressional review. This would be a reversal of priorities under existing law. The federal water contractors' rights derive from and are no greater than the Bureau's water rights for the CVP. Thus, there is no breach of federal water contracts when the state validly limits CVP diversions from the Delta under its ongoing authority over Bureau permits, including its duty to protect the public trust. Giving preference to Delta exports not only reverses existing priorities, but also jeopardizes the resources of the Delta and Bay if a water shortage were to occur during the period established for congressional review.

Sale of CVP Water to the State

We are pleased to see that the Bureau and Department have decided to proceed with negotiation of a coordinated operation agreement separate from negotiations on an agreement for the sale of CVP water to the SWP and for state wheeling of federal water. While a water sale and wheeling agreement has the potential for increasing the efficiency of water use, any proposal for increasing overall exports from the Delta must be considered in the context of the need for better protections for water quality in the Delta and Bay. Moreover, the assumptions underlying the Bureau's projections of the availability of water for sale under the operation agreement must be thoroughly explored prior to any sales agreement. It is therefore evident that such an agreement will require extensive environmental review and will be affected by possible changes in Delta standards as a result of the State Water Resources Control Board's review of D1485 to begin in 1986.

Because of the uncertainties surrounding the sale of federal water to the state, we are opposed to the provision in the current draft operation agreement which would allow either party unilaterally to terminate the agreement if a water service and wheeling contract is not negotiated by the end of 1988. The coordinated operation of the CVP and SWP has obvious advantages apart from the potential for sale of any available CVP water to the SWP, including chiefly the assurance that the Bureau is committed to Delta protection. These advantages should not be a *quid pro quo* for increasing exports from the Delta.

In closing, we again commend you for your continued efforts to achieve an agreement for coordinated project operations. We understand that once an agreement is reached, your agencies will be soliciting additional public comment as part of the EIS/EIR process. We still believe it best, however, to attempt to negotiate, prior to the environmental review process, an agreement which adequately considers the needs of the Bay and Delta and not just the interests of the projects and their contractors.

Sincerely yours,

Thomas J Graff

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Enclosures

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BEFORE THE UNITED STATES
HOUSE OF REPRESENTATIVES
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS

SUBCOMMITTEE ON WATER AND POWER RESOURCES

TESTIMONY OF THE ENVIRONMENTAL DEFENSE FUND ON THE DRAFT AGREEMENT BETWEEN THE UNITED STATES OF AMERICA AND THE DEPARTMENT OF WATER RESOURCES OF THE STATE OF CALIFORNIA FOR COORDINATED OPERATION OF THE CENTRAL VALLEY PROJECT AND THE STATE WATER PROJECT

presented by:
THOMAS J. GRAFF
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WASHINGTON, D.C.

May 23, 1985

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MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

Thank you for inviting me to testify here today on the May 8, 1985 draft coordinated operation agreement (COA) between the Central Valley Project and the State Water Project. I appear today on behalf of the Environmental Defense Fund and its members, but more importantly I will attempt to speak for the San Francisco Bay/Delta estuary. No environment in California is more profoundly affected by the COA than the Bay/Delta's, although certainly both the San Joaquin Valley and the great urban complex south of the Tehachapis are intimately involved as well. But others, particularly those who contract for water from the State and Federal governments, will speak today on behalf of the San Joaquin and southern California. Thus, although I recognize that all who work seriously on the management of California's water resources have obligations to the whole state, not just to one region, my emphasis will be on needed protection for the Bay and Delta.

The Bay and Delta do need a COA. They need assurance that the Central Valley Project will be operated not only to provide life-giving irrigation water to the fields of the Central Valley (as well as incidental power and municipal and industrial water to various public entities in northern California), but that it also will be operated to provide reasonable levels of freshwater flow to the Delta and to San Francisco Bay to help protect the public trust in those waters.

The real question before you today, in my judgment, is whether the May 8 COA draft provides that assurance. My answer to the question is: No, it does not provide that assurance, but it does commit the Bureau of Reclamation to a little more protection than it has admitted was its responsibility in the past. The result is a qualified partial endorsement by EDF of the May 8 draft.

Before I address the problems which we see in the May 8 draft, let me note its considerable strengths. Most important, Article 6 of the draft resolves in a manner satisfactory to both the state and the federal project the extraordinarily difficult and complex issue of the relative contributions the two projects will make in discharging their respective responsibilities for maintaining Delta outflow. The 75-25 and 55-45 percentages established in Article 6 may seem simple enough; the hydrology and the political compromising that underlie those numbers were impressively complicated. Both incumbent administrations and their immediate predecessors deserve praise for coming to an agreement on this matter rather than having a court of law try to sort out the projects' relative priorities.

The projects also deserve limited praise for their agreement in Article 11. The Bureau of Reclamation, in that Article, has agreed that it will operate the CVP in coordination with the SWP to meet the Decision 1485 standards of the State Water Resources Control Board. That is an important commitment on the Bureau's part.

What then are the COA's major weaknesses? In my judgment, there are three:

(1) The agreement is only for a limited duration;

(2) The agreement leaves ambiguous what will be the Central Valley Project's response when new Delta standards (and Bay standards) are adopted by the State Water Board (and approved by EPA); and

(3) The agreement includes provisions for the sale and wheeling of CVP water to and by the SWP which will potentially commit a significant amount of additional water to Delta export that would otherwise be available for Delta outflow required to meet the needs of the Delta, of Suisun Marsh, and of San Francisco Bay.

In a moment, I will attempt to explain these criticisms in greater detail. First, however, I do think that it is important at this stage for me to note that I do not believe we are necessarily engaged here in a zero sum game. It is not the case that an extra acre foot of water use in the Valley or in southern California must mean an acre foot less of Bay/Delta outflow. There are alternatives to this formulation. Some do not involve Delta exports at all. For example, an extra acre foot of conserved water in the Imperial Valley, when leased or purchased by the MWD or some other agency, may serve urban southern California just as reliably and at a lower cost than an extra acre foot of Delta export. The same is true if a Westlands farmer trying to avoid shutting down because of drainage problems saves water and seeks to sell it in southern California. Other alternatives do involve Delta export, but also involve less in-basin consumptive use. Thus, if a Sacramento Valley rice farmer chooses to grow a less water-intensive crop or turns to irrigation scheduling or laser levelling of his fields and the institutional structure is in place to allow these farmers to sell the water conserved by their actions, Delta export may be increased while Delta outflow stays the same.

The key test for the COA should therefore be whether it facilitates water transfers of the types just enumerated as an alternative to the export of additional Bay/Delta water south. Because it lacks certainty, since its commitment to Bay/Delta standards is of limited duration and ambiguous in its scope, and because it seems to prefer the diversion of "additional" water south to the transfer of newly "conserved" water, we submit that the COA fails this key test.

The COA is of limited duration because by its own terms either party can terminate the agreement any time after December 31, 1988 on 180 days' notice if permits have not been received for the export of additional water south. Article 10(h)(5). The COA can also be terminated without notice if a one-year long arbitration process begun early in 1989 does not result in a unanimous recommendation of terms for a contract for the sale and wheeling of CVP water to and by the SWP. Article 14(b)(1).

Finally, the COA can be terminated if one of the parties requests an amendment to the agreement to which the other party does not agree and three years have passed in fruitless negotiation and arbitration. Article 14(b)(2).

The COA is ambiguous in its commitment to Delta protection and silent in its commitment to Bay protection because it does not specify what will be the United States' reaction when new Delta standards and initial Bay standards are set by the State Water Board (an action currently scheduled to take place in 1988). Article 11 gives the U.S. authority to comply with new Delta standards (Bay and Suisun Marsh standards are not included) if it determines the new standards are not inconsistent with any Congressional directives. But assuming the U.S. determines that the new standards are inconsistent with Congressional directives, the agreement does not specify whether the U.S. will abide by the new standards pending the outcome of litigation over those standards. The agreement also does not require (it only permits) the U.S. to seek enactment of legislation resolving any alleged inconsistencies between the new standards and existing law. Thus, Article 11 is a step in the right direction insofar as it obtains a current Bureau commitment to existing Delta standards, but it is also inadequate because it leaves major ambiguities as to the extent of the Bureau's commitment to meet future standards for the Delta and Bay, an inadequacy rendered especially grave by the attempt in Article 10 potentially to commit large amounts of additional CVP water for export both to the SWP and its contractors and to CVP contractors as well.

Some will argue that the Bureau's current commitment in Article 11 to providing its share of Delta outflow to meet the requirements of D-1485 is so important that the agreement should be approved even if it is uncertain how long the Bureau's commitment will last or what its scope will be in the future. There is strength to this argument. Once the Bureau is finally on record that it has a contractual obligation to the Delta, it may not be so difficult to convince future federal Administrations that they should contribute to the meeting of new improved Delta standards or even of Bay standards. It surely would not be easy for the Bureau to walk away from the COA in 1989.

On the other hand, if the new standards adopted in 1988 are considerably more protective of the Bay and Delta than were those the Board adopted in 1978, as EDF and many Bay/Delta advocates believe they should be, then the Bureau may well renege on its Delta commitment. Recall that under the existing standards, the Delta striped bass fishery has declined to less than 20 percent of its historic level. Note that EPA approved the D-1485 standards in 1980 only on the basis that the fish protection standards established in D-1485 actually be met in practice, a condition subsequent that all agree has not been met. And realize that all the competent fish biologists who have studied Bay/Delta fisheries, irrespective of what their views might be on the advisability of one or another physical facility in the Delta, concur on one point. They all agree that levels of Bay/Delta outflow and of project diversions, especially during periods critical for fish spawning and habitat preservation, are both crucial factors in determining Bay/Delta fish survival rates.

If the Bay and the Delta are to be protected, therefore, it will take more than a signed COA. It will take more Bay/Delta outflow.

Yet, as I have already noted, Article 10 of the May 8 COA is a prescription for less Bay/Delta outflow, not more. The principal purpose of the newly revised Article 10 is to permit the CVP to sell more water, in equal shares to the SWP and to its own contractors. In the January 30 draft of the COA, which was the last version available to EDF and others of the interested public before the last-minute flurry which produced the May 8 draft, the issue of a future accord on SWP conveyance and purchase of CVP water was limited to three brief subparagraphs. The January 30 version of the COA merely called on the parties to promptly commence negotiating, noted that permits would need to be obtained if a contract was to be successfully consummated, and stated that if agreement was not reached by December 31, 1988, either party could undertake proceedings leading to the termination of the entire COA. EDF, by letter of January 28 to Directors Houston and Kennedy, had strongly criticized these provisions, particularly the termination provision in then subparagraph 10(h)(3).

Now in the May 8 draft, while the projects have retained the unfortunate termination provision in its essential terms, they have also substantially fleshed out the terms of the projects' proposed conveyance and purchase contract. These terms give the CVP priority to any available space in the California Aqueduct. They also require the SWP to convey an equal amount of additional CVP export water to that which it purchases on its own account for SWP export.

EDF has not had the time or the opportunity to analyze the probable effect of these provisions in detail. But our tentative judgment is that these provisions, apart from taking a major step toward increasing the projects' Delta exports, also will make it more difficult rather than easier for the Sacramento Valley rice farmer or the Westlands farmer with drainage problems to sell excess water to San Diego. They therefore need very careful scrutiny before they are approved. The CVP, as a potential water seller to the SWP, already has several tremendous advantages over the farmers who I have just postulated might voluntarily want to sell their excess water. First, the CVP's current melded rate for pumping irrigation water is less than a half cent per kilowatt hour. By comparison, PG&E's cheapest residential electricity rate is over six cents per kilowatt hour. Thus, pumping CVP water to O'Neill Forebay costs a potential buyer less than $1.50 per acre foot. At SWP pumping costs, the charge would be over $8.00 per acre foot, while at even the cheapest PG&E residential rate, the charge would be over $18.00 per acre foot.

Second, the CVP (and indeed the Bureau as a whole) has been very slow to take a position as to whether its contractors may conserve and resell CVP water at a profit, even though state law clearly contemplates and approves such exchanges. Thus, even as Westlands farmers currently struggle with the problem of how to shut off the flow of drainage water to Kesterson Reservoir and are being approached by prospective water buyers from San Diego, the Bureau has been silent as to whether it would allow (or indeed encourage) such an exchange to occur.

Finally, the two other potential major water middlemen in the state, the SWP and the MWD, have thus far shown just as little inclination to get involved in brokering water transfers around the state (among others than themselves) as has the CVP. Indeed, every time San Diego has shown an entrepreneurial initiative toward the obtaining of an additional water supply for itself, the MWD has thrown cold water on the idea, raising both legal and competitive impediments to San Diego's activity.

To sum up, in EDF's judgment, as long as the big three (the CVP, the SWP and the MWD) continue to drag their feet, the potential for significant water marketing around the state will go unrealized. And as long as that potential is unfulfilled, the battle over nearly every drop of Bay/Delta water--should it be exported or should it be dedicated to Bay/Delta outflow?--will continue unabated.

What then should Congress do with the May 8 COA? Our advice is simple. Ask the projects to decouple Article 10 from the rest of the agreement. EDF can live with Article 11, even though it isn't perfect. We would look forward to four years of experience living under the joint operation contemplated in Article 6 and take our chances that the Bureau won't walk away from the deal in 1988 if standards are toughened. But we would not trade that approval of the Bureau's commitment to Delta standards (which is anyway required by existing law) for acquiescence in substantial additional Bay/Delta exports and at best benign hostility to the water marketing alternative. The issues raised by Article 10 deserve careful assessment independent of the COA with a great deal more public and political debate than they have yet received. We would therefore urge this subcommittee to report a bill approving the COA, with Article 10 modified to defer the question of wheeling and purchase of additional CVP water to another day.

EXHIBIT 3

EDF LETTER, May 1989

Water Trades Can Help Meet Future Urban Needs

We are pleased to be able to bring to EDF LETTER readers' attention the following article, which was co-authored by Carl Boronkay, General Manager of the Metropolitan Water District of Southern California, and Charles Shreves, General Manager of the Imperial Irrigation District.

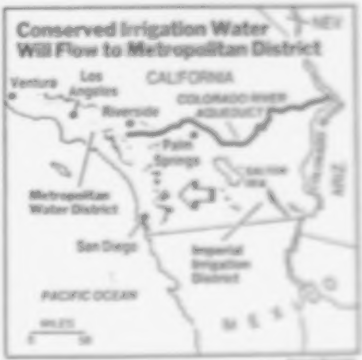
CARL BORONKAY

CHARLES SHREVES

A landmark water conservation agreement was signed on January 17 between California's largest public urban water agency, the Metropolitan Water District of Southern California, and the largest irrigation district in the United States, the Imperial Irrigation District. This agreement heralds the way for helping to meet the increasing urban water demands of the future in two ways. First, it demonstrates the potential for meeting future water needs by making better use of existing, developed water resources. Second, the cooperation between different types of public agencies involved with water supply sets the pace for future co-beneficial agreements.

The immediate outlook for new major water projects in California is dim, a situation to which EDF has made a noted contribution. Metropolitan, a public agency which is responsible for more than half the water used by about 14.5 million people in six counties, has therefore intensified its efforts to make more effective use of the available water of the state.

Metropolitan has always had a strong interest in water use efficiency within its 5200-square-mile service area. The agreement, however, includes a number of new and promising initiatives to bring about more efficient water use in other districts, where Metropolitan will bear the costs and the water conserved will be available to it with no reduction of supply for the cooperating district.



$115 Million Conservation Plan To Be Completed Within 5 Years

In brief, the MWD/IID agreement provides for Metropolitan to bear the capital costs of specific conservation projects, as well as indirect costs such as the loss of hydro power—about $115 million—plus annual operation and maintenance costs of $3.1 million. In return, Metropolitan will have available the water that will result from those projects—an assured minimum of 100,000 acre-feet annually. (An acre-foot can be envisioned as one acre of land covered with water one foot deep.)

The program calls for structural and non-structural conservation measures, including projects to line existing irrigation canals, construct local reservoirs, and install gates and automation equipment along with monitoring and management measures. All projects are to be completed within five years. The water thus conserved will meet the residential needs of about a million people in Metropolitan's highly urbanized service area.

The cooperative program takes advantage of the long-held agreements of both districts with the Federal Bureau of Reclamation. Imperial, the largest user of California's share of Colorado River water, shares with other agricultural agencies the bulk of California's water right. Their delivery priority is superior to Metropolitan's; in most shortage situations, only Metropolitan is affected.

While Imperial makes good use of the water delivered under its Federal contract, it is well established that substantial water is lost in transit—largely through seepage in earthen canals. In addition, a number of improvements in irrigation practices and the updating of some facilities in IID's delivery system would allow greater efficiency in water use.

Pact Assures That Farmers Won't Lose the Most Essential Ingredient for Farming

Significantly, these improvements would not reduce the net amount of water used by the farmers, but will conserve water now lost through outdated transport and irrigation practices. The improvements are expensive, however, particularly in terms of farming economics. Metropolitan has therefore proposed that it finance an agreed-upon conservation program in return for the water so conserved. In this way, there is no damage to agriculture in meeting a portion of the growing needs of the metropolitan area.

Apart from the importance of the agreement itself, the experience in working it out over a period of almost five years has been instructive and beneficial. Any proposals involving water rights of farmers, regardless of their merits, are generally met with skepticism, if not hostility, borne of fear of losing the most essential ingredient for farming.

The time spent achieving this agreement was well spent for it has set the groundwork for additional mutually beneficial agreements between Metropolitan and Imperial, or between Metropolitan and other California agricultural agencies using Colorado River water. The agreement should also be an encouraging example to other agricultural agencies in California with which Metropolitan has initiated discussions for conservation programs that will allow more effective use of California's water resources.

Finally, the agreement should also serve as a model to assist other, possibly disparate, water agencies in reaching similar accords that result in more efficient use of those resources that have already been developed.

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Environmental Quality, Water Marketing, and the Public Trust: Can They Coexist?

Thomas J. Graff *

Nearly my entire professional lifetime has been spent in behalf of environmental protection in the West, most of it in the field of water resources. During that time I have become increasingly committed to integrating economic analysis with environmental preservation values. I believe that my employer, the Environmental Defense Fund (EDF), has also become committed to that philosophy. We have long advocated least-cost investment planning for major private and public electric, gas and water utilities. We have experimented with attempts to qualify what most have thought to be unquantifiable environmental and recreational assets such as trout streams and high-quality river rafting. We have sought to introduce economic criteria into a range of pollution control regulatory and investment contexts, most recently in connection with the growing problem of drainage from irrigated agriculture in the West. And for many years we have championed and promoted relaxed marketing of water rights in the West as an alternative to the government subsidy-and-regulation policies which have been the dominant method of allocating scarce water in all the Western states.

The question then arises: if we are so committed to an economic way of thinking, what are we doing promoting the greater application of the public trust doctrine in the water rights field? The public trust doctrine is a lawyer's and judge's dream. But at least at first glance it seems to leave little room for the balancing of economic costs and benefits. And certainly it seems to elevate public property rights to a status well above those of private property, a result that inevitably will lead to more bureaucratic inefficiency and less market-based efficient allocation of private property interests in water.

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* Thomas J. Graff, Senior Attorney, Environmental Defense Fund. Adapted from a presentation given at a symposium on "Western Resources in Transition: the Public Trust Doctrine and Property Rights," sponsored by the Political Economy Research Center at Bozeman, Montana May 17, 1986.

I think there are several answers to the question of why we have promoted the implementation of the public trust doctrine, in at least some situations, which should be acceptable to all but the most extreme devotees of libertarian thought. They hinge primarily on the concept of market failure. They include situations where interests in public resources are shared so broadly among so many people, without any reasonable method for restricting access to those resources, that the only way to protect those resources is by public intervention, and situations where economic activity causes negative environmental externalities to publicly held goods or values.

To take the most salient example, there appears to be no effective way to tax every bird watcher or duck hunter who takes pleasure from the birds nesting or feeding at Mono Lake. Nor is it likely to be feasible to assess every passer-by on Route 395 who enjoys the view of the Mono Lake Basin. Yet these disparate interests are committed to having the greater society take their values into account in determining the future of Mono Lake. Judicial implementation of the public trust doctrine is one means to force society to come to terms with the conflict in values over what should be Mono Lake's future. Many who have criticized the California Supreme Court's decision in the Mono Lake case, I believe, have insufficiently recognized that it was not the Court which created the clash over Mono Lake's future, but rather the contending litigants.

Having said this much, let me say now that I do not believe that the courts, via the public trust doctrine or any other legal artifice, will decide Mono Lake's future. The public support for Mono Lake's preservation is so pervasive that I am convinced it will cause the Governor and Legislature of California to fashion a compromise between environmental interests and the City of Los Angeles. Such a compromise will limit the City's diversions from the basin and will include some financial contribution, direct or indirect, by the state (and perhaps the federal government) that will partially compensate the City for its loss of water and power. A political problem with environmental and economic components will be solved in the political area. Contrary to de Tocqueville's maxim that all major American political questions eventually become judicial questions, I believe the various Mono Lake legal controversies will recede when a political compromise is hammered out. The myriad lawsuits are basically tactical devices to win advantage in the political negotiation yet to come.

The second major water controversy in California where the public trust doctrine is lurking barely below the surface of public consciousness and contentiousness involves the level of freshwater inflow to San Francisco Bay. In 1978, a California regulatory board, the State Water Resources Control Board, issued a water rights and water quality decision dividing the waters of the Sacramento and San Joaquin River systems between Sacramento and San Joaquin Delta interests. One interest group included agricultural, municipal, industrial and fishing interests, and the other group included the two major water projects which divert water from the San Francisco Bay/Delta Estuary, the Federal Central Valley Project and the State Water Project. Approximately a dozen challenges to that decision were taken to the courts of California and are now pending before a California Court of Appeal in San Francisco.

One of these challenges raises the failure of the State Board to employ the public trust doctrine to protect the environmental values of the entire San Francisco Bay/Delta Estuary. This challenge appears in an amicus brief EDF filed in association with several other environmental and fishing groups. I am hopeful (what kind of a lawyer would I be if I were not?) that the Court of Appeal will soon issue an opinion invoking the public trust doctrine to protect the Bay and Delta that will give direction to the Board as it again begins the process of hearing evidence which will lead to a decision in 1989 or 1990 updating its 1978 decision.

It may be instructive, moreover, to describe what kind of directions we are asking the courts to give to the Board as it allocates the water of the Sacramento/San Joaquin and Bay/Delta/Estuary systems. We are asking for more economic investigation, not less. We are calling on the Board to consider whether the diverters' uses of water from the Estuary are economic. What about all those government subsidies which encourage too many diversions? We will be asking the Board to consider what would be the extent of the need for diversions if the major diverters encouraged, rather than obstructed, the free trading of water in the state. And we will be asking what would the real need for diversions be if water were priced at what it is really worth or at least at what it actually costs to store and deliver.

Admittedly an imperfect, cumbersome, and not very expert State Board will hear the evidence and allocate the waters of the estuary. The Board, much like the California Public Utilities Commission in the mid-1970s when we first brought economic criteria to the electric utility investment business, has only recently hired its first staff member who has an economic background and is not even employing him as an economist. But the locus for deciding the Bay's future is at least formally in the Board. And we at EDF, in invoking the public trust doctrine, are merely asking that widely shared public values in San Francisco Bay water quality and ecological integrity be weighed in the balance where previously they have been ignored entirely or given extremely short shrift.

What then do these two examples (Mono Lake and San Francisco Bay) of highly visible, and yet very complex and contentious, controversies teach us? I suppose that we are doomed to live in a era of mixed systems. Private and public property rights. Public trust doctrine and free marketing of water rights. Economists and lawyers.

Having said that in a room probably filled with committed libertarians, let me hasten to add that I agree with those who are critical of the public trust doctrine because its broad application raises some serious problems. I will now detail a few of those problems and make a few suggestions as to how the use and scope of the doctrine should be deployed to reduce those problems to a minimum. I have already alluded to the first problem. Judicial implementation of a public trust doctrine to protect environmental resources diminishes the certainty with which private property interests in water are held. If appropriators of water from a stream are forever subject to the open-ended possibility that a court or a regulatory authority may seek to take back that appropriated water to protect the instream value which that diversion may be threatening, the appropriative right, which may long have been thought by its holder to be a vested right, may turn out instead to be an illusory right. Moreover, the uncertainty which is engendered by the possibility that the public trust doctrine will be invoked may well make the transfer of that appropriative right less likely and it certainly will make the right less valuable. A potential buyer seeking a new water supply may well be deterred from paying the transaction costs of negotiating a water purchase if his prospective supply is subject to a higher and non-compensating use, thus possibly precluding a more efficient use for that water.

A second problem arises because it is unlikely that the courts will see fit to limit application of the public trust doctrine only to those resources which truly are "public" in nature and to which access cannot reasonably be restricted. It is my understanding that the Montana legislature has recently sought to make a distinction between categories of streams where public access and public management are prescribed and others where private control will continue to be the norm. Whether such a distinction can be made successfully, time may tell. It certainly will be difficult to fashion criteria that satisfactorily distinguish cases where public intervention is justified from those where it is not.

Finally, a third problem also already alluded to is the perceived arbitrariness of bureaucratic allocation of resources. So-called "public choice" theorists and others have convincingly made the case that bureaucrats (and most probably judges) frequently, if not invariably, act in ways which maximize their own interests rather than those of the public they are theoretically serving. Moreover, in many cases, even where the motivation of bureaucratic or judicial decision-makers is not suspect, their capacity to make sensible allocation decisions among competing resource claimants is likely to be biased by political philosophy, environmental attitude, and information limitations. When eco-minded decision-makers are in power, which tends to be rather rare, the pendulum will swing one way. When the boomers take over, the pendulum swings the other way.

These are all serious problems. None is easily solved. But in trying to bring this presentation to a close, let me suggest if not a resolution of these problems at least the beginning of an approach to their amelioration. In essence, what I will recommend is an effort to integrate the economist's interest in efficiency with the environmental lawyer's advocacy of judicial and bureaucratic preservationist doctrine.

First, we should all recognize that the principal reason the public trust doctrine is being employed and discussed ever more frequently in judicial and academic circles is that generally the value society is placing on environmental and recreational amenities seems to be steadily increasing. People may debate whether this is primarily a function of higher incomes, increasing population density, or diminishing environmental quality, but the phenomenon is difficult to dispute. Fifty years ago no one thought twice about the value of a wetland or a tidal marsh if economic development was proposed on such a site. Today, as they have become increasingly scarce, society values such environments much more highly. Accordingly, at least in a rough sort of way there is frequently an implicit economic valuation taking place when the public trust doctrine is invoked to protect a particular environmental resource.

Second, as societal experience with the public trust doctrine concept increases, economic criteria are likely to play an increasing role in the real-world decisions which flow from application of the doctrine. The Mono Lake case has been remanded to lower courts and may be referred to the State Board for fact-finding which will balance the interests of the lake and its supporters against those of the City of Los Angeles. In the San Francisco Bay situation, as I noted earlier, EDF has already announced its intention to urge the Board to consider economic evidence and arguments in allocating the waters of the Bay/Delta estuary. The public trust doctrine, at least as it applies to water rights allocation, is still in its infancy, yet it is clear that its implementation will involve the application of economic criteria.

That still leaves the question, however, whether a market in water can be integrated with the application of the public trust doctrine. Bureaucratic or judicial implementation of economic criteria does not a market make. Here I think progress is still in a fledgling state. Earlier in this presentation I predicted the ultimate resolution of the Mono Lake controversy and labelled that resolution political. But that resolution, if it takes place, can also be termed an economic and almost a market solution. Representatives of the public that appreciates Mono Lake, i.e., the state and perhaps the federal government, will pay Los Angeles at least partial compensation for foregoing a significant percentage of its potential diversions from the Mono Lake Basin. In the San Francisco Bay situation, such a political/economic solution is both harder to fashion and to predict, but the seeds of such an approach have already been sown. A bill now wending its way through Congress reallocates the costs of the Central Valley Project so that if more Project water is ultimately dedicated to Bay/Delta protection, less reimbursement of the Project's financial cost will be required of its water contractors. Similarly, at the state level, discussion has begun concerning a similar reallocation of cost to the state taxpaying public as a proxy for the public interest in the Bay should more water be dedicated to Bay outflow.

I do not mean to suggest that the above approaches to resolve the Mono Lake and San Francisco Bay controversies are perfect. Far from it. Indeed, a lengthy and bitter debate is anticipated concerning the question of what segment of the public benefits from invocation of the public trust and what segment of the public should compensate the property rights holders whose interests are infringed by application of the trust (if compensation is to be paid at all). Not all California taxpayers are bird-lovers. Nor is it clear that a resident of New Jersey or even of San Diego has such a compelling interest in the ecological health of San Francisco Bay. Our democratic political process, with its inevitable trade-offs, is at best an imperfect method for discerning the preferences of the body politic. But for the major public resource questions we face it is the best we have.

I conclude with an exhortation. Let's just make sure that as political decisions are made to allocate our resources, both the public's interest in environmental preservation and its interest in economic efficiency are considered. In many situations, if not in most, the two should be reconcilable, particularly if the environmental concerns are given the imputed economic value which they deserve.

REGIONAL AND STATE WATER RESOURCES PLANNING AND MANAGEMENT
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TRADING CONSERVATION INVESTMENTS FOR WATER

Robert Stavins and Zach Willey[1]

ABSTRACT: This paper investigates whether the Metropolitan Water District of Southern California (MWD) can obtain additional supplies of Colorado River water by financing water conservation investments for the Imperial Irrigation District (IID). The analysis contrasts the costs of an IID-MWD water transfer with the costs of the various alternatives open to MWD for increasing its total water supply. A marginal-cost analysis indicates that a water transfer would cost MWD less per acre-foot than would traditional alternatives such as expansion of the State Water Project. We estimated that the net savings to MWD would be more than $710 million over a 20-year transfer period. The net economic benefit of the proposed water transfer is also evaluated from the perspective of the Imperial Irrigation District; the analysis indicates that the transfer would indeed be in the economic interest of IID. If a transfer program were combined with the implementation of conservation measures within the IID service area, then water transfers from IID to MWD would be technically feasible and economically beneficial to both parties to the transaction.

(KEY TERMS: water transfers; conservation investments; alternative water supplies; marginal costs analysis; Southern California water use; Colorado River water allocation.)

INTRODUCTION

During the public debate in California over the so-called Peripheral Canal in 1982 (Proposition 9 on the June 8, 1982, ballot), several government agencies and a number of public and private water purveyors voiced substantial concern regarding possible future water shortages in the southern part of the State. In particular, the Metropolitan Water District of Southern California (MWD), which provides water to approximately twelve and a half million persons, repeatedly expressed concern that its future allotments of Colorado River water would be drastically curtailed later in this decade. In light of the voters' rejection of the Peripheral Canal in June of last year, it is imperative to investigate alternative means of meeting California's water needs. Specifically, what alternatives are available to MWD to mitigate its expected decline in Colorado River deliveries?

While the construction of more dams, reservoirs and conveyance facilities may still be the most obvious solution to a possible future supply-demand imbalance, that approach is no longer necessarily the wisest nor the most economically rational one. Alternative measures which merit serious consideration include ground water basin development, waste water reclamation, and certain economic, institutional and legal reforms. Such reforms encompass a set of effective and as yet largely untapped approaches to increasing the efficiency of the use and allocation of the State's precious water resources.

From an economic perspective, any attempt to increase the efficiency of the State's usage and allocation of its water supplies ought to include three critical elements:

1. the use of free-market principles,
2. a commitment to cost-effective public investment, and
3. the implementation of a price structure which provides accurate signals to consumers regarding the relative scarcity of the resource.

The first element, that of free-market principles, refers mainly to the use of competitive markets for the transfer of water from willing sellers to willing buyers (Phelps, *et al.*, 1978). If properly executed, such transfers may result in economic benefits to both parties. This paper investigates in detail one such potential water transfer in Southern California, based upon a year-long study carried out at the Environmental Defense Fund in Berkeley (Stavins, 1983).

The Imperial Irrigation District (IID) is by far the largest single user of Colorado River water in the State of California, diverting nearly three million acre-feet (AF) annually in recent years. A number of State and Federal studies have examined the efficiency of irrigation within the IID service area and have identified significant potentials for improving water use efficiency (California Department of Water Resources, 1976; U.S. Department of the Interior, 1978; California Department of Water Resources, 1979). These findings do not necessarily imply that the District itself has ignored opportunities for water conservation. Indeed, IID has carried out a number of water conservation programs, beginning about 10 years ago.

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Although IID has become increasingly concerned in recent years about its overall water-use efficiency, additional conservation opportunities exist which would be both technically and economically feasible. This was the major conclusion of a recent investigation into IID's use of water by the California Department of Water Resources (DWR) (1981a). DWR found that the construction of more efficient facilities and the employment of improved management practices by IID and its farmer-customers could lead to annual savings on the order of 450,000 AF without any curtailment of agricultural production (Table 1). Because of the extremely low price it pays for its water supply from the Colorado River, IID has not found it to be in its (economic) interest to develop many of the conservation facilities on its own or to initiate the practices which would lead to such massive water savings.

This is where the concept of a transfer becomes valuable. The Metropolitan Water District (MWD) is concerned that its future supply of Colorado River water will be reduced by approximately 400,000 AF per year, after the Central Arizona Project (CAP) begins operation later in this decade. MWD pays a great deal more for its water supply (on an acre-foot basis) than does IID, and the alternatives open to MWD for augmenting its future supply (to mitigate its expected loss of Colorado River water) involve substantial costs.

Is it possible that a mechanism could be developed whereby water-use efficiency in the IID service area would be increased and the newly available "conserved water" be transferred to MWD in such a manner that both the Metropolitan Water District and the Imperial Irrigation District would gain from the transaction? This is the question which this paper addresses. A marginal-cost analysis leads to the following conclusion: If a transfer program were combined with the implementation of conservation measures within the IID service area, water transfers from IID to MWD would become technically feasible and economically beneficial, both for the "buyer" of the water, the Metropolitan Water District of Southern California, and its "seller," the Imperial Irrigation District.

A PLAN FOR TRADING CONSERVATION INVESTMENTS FOR WATER

Under what specific conditions would the IID-MWD water transfer arrangement be mutually beneficial to the Imperial Irrigation District and the Metropolitan Water District? Various alternative mechanisms for facilitating an IID-MWD water transfer were considered; one such approach was identified as deserving detailed investigation. That approach encompasses a set of scenarios in which MWD

TABLE 1. Opportunities for Water Conservation in the Imperial Irrigation District.

Source of Saved Water	Estimated Annual Loss (acre-feet)	Estimated Annual Amount to be Saved (acre-feet)	Unit Cost of Water ($/AF)*
	DISTRICT CONTROLLED		
Line All-American Canal**	78,000	70,000	115
Line Main Canals & Laterals	122,000	110,000	31
Expand Seepage Recovery System	78,000	30,000	14
Canal Spills: construct more regulatory reservoirs			34
Canal Spills: expand electronic monitoring control and provide more flexible deliveries	53,000	50,000	Unknown
(SUBTOTAL)	(331,000)	(260,000)	
	FARMER CONTROLLED		
Improve On-Farm Irrigation Techniques re. Leach Water	570,000	178,000	Variable
Expand Use of Tailwater Recovery			8-25
(SUBTOTAL)	(570,000)	(178,000)	
TOTAL	901,000	437,000	

*Based upon 30-year life and 12 percent interest; 1981 dollars.

**Pilot Knob to East Highline Canal.

Source: California Department of Water Resources. Investigation Under California Water Code Section 275 of Use of Water by Imperial Irrigation District. Southern District, December 1981, pp. 56, 60, and 61.

would itself construct (pay for the construction of) water conservation facilities, with a lifetime in excess of 30 years, in the IID service area. MWD would receive the Colorado River water thereby conserved for a period of 20 years; following this, IID itself would receive directly the full benefits of the conserved water for the remaining lifetime of the facilities.

Based upon previous research by the California Department of Water Resources (1981a), five water-conservation-and-transfer scenarios were analyzed. The first scenario, 30,000 AF/year, provides for the expansion of seepage recovery systems (Table 1). The second transfer scenario, 200,000 AF/year, includes those systems plus the improvement of on-farm irrigation techniques regarding leach water and expansion of tailwater recovery systems. The third scenario, 300,000 AF/year, includes the prior improvements plus the lining of main canals and laterals. The fourth transfer scenario, 350,000 AF/year, includes all the above plus the reduction of canal spills through the expansion of electronic monitoring control and provision for more flexible deliveries. Lastly, the fifth scenario, 400,000 AF/year, includes all these conservation methods plus the lining of the All-American Canal.

The central analysis consists, then, of the calculation of the economic benefits and costs of this set of proposed transfer scenarios, ranging from 30,000 AF/year up to 400,000 AF/year.

WOULD AN IID-MWD WATER TRANSFER BE BENEFICIAL TO BOTH PARTIES?

To address the general question of whether the proposed water transfer scenarios would be beneficial to both MWD and IID, it is helpful to formulate a number of more specific inquiries:

1. What is the appropriate decision (investment) criterion for MWD to use in identifying favorable approaches to mitigating its expected future decline in Colorado River deliveries?
2. What does that investment criterion (the so-called "marginal cost" of alternative projects) indicate with regard to the proposed water transfers as compared with the various alternatives which are open to MWD of dealing with a future supply-demand imbalance?
3. Is it possible to appraise quantitatively the economic benefit which accrues to MWD as a result of entering into a transfer arrangement?
4. What is the appropriate decision criterion for IID to use in deciding whether or not to enter into a water transfer arrangement with the Metropolitan Water District?
5. What does the criterion indicate with regard to the economic wisdom, from IID's perspective, of agreeing to any of the proposed water transfer scenarios?

IDENTIFYING AN APPROPRIATE INVESTMENT CRITERION FOR MWD

The Metropolitan Water District of Southern California has repeatedly forecasted a future water supply-demand imbalance within its service area later in this decade, after the Central Arizona Project comes on line and MWD's Colorado River entitlement is consequently reduced. Certainly, all feasible alternative methods of mitigating this projected water deficit ought to be considered by MWD before identifying preferred strategies. Such alternative methods include demand modification (i.e., conservation within the MWD service area) and supply augmentation.

What criterion or set of criteria ought to be used in selecting preferred alternatives? To keep its customers' water rates (and property taxes) as low as possible, one essential criterion for MWD to utilize in its decision process is that of cost. Thus, from a general financial perspective, a least-cost investment criterion emerges.

There are numerous ways of measuring costs. From an economic perspective, it is the incremental cost of developing an additional unit of water supply (or of curtailing demand by an additional unit) which ought to be examined for alternative methods (of balancing supply and demand). Thus it is the marginal costs of alternative supply augmentation schemes which are contrasted with the marginal cost of water transfers in this paper.

Because of the means which are used to determine energy costs and several other components of the full marginal costs, the totals significantly exceed the actual dollar amounts which would be involved for any of the alternatives. Throughout California, water is priced on the basis of average, not marginal, cost. Nevertheless, true marginal costs are calculated (on the same basis for all alternatives) because they provide the most economically valid set of numbers upon which MWD (and IID) should make decisions about alternative project investment strategies.

CALCULATING THE MARGINAL COSTS OF THE MWD-IID WATER TRANSFER PLAN

To compare alternative investment strategies which involve costs and benefits spread over different time periods, it is customary to "discount" all monetary amounts to a base year (in this case, 1986). The total marginal cost of a particular water supply option may then be determined by measuring the present value of all current and future marginal costs.

Of greater interest when comparing alternative water supply strategies is the marginal cost in dollars per acre-foot per year. This marginal per-acre-foot-per-year cost can be thought of as a water charge which would have to be collected to produce a series of annual payments precisely adequate to repay all project costs.

Several simplifying assumptions are implicit in the investment model utilized in this paper. First, it was assumed that "instantaneous" construction occurs in the first year of the relevant period of analysis, a typical assumption in analyses such as this. The year 1986 was utilized in the analysis as the beginning of the 20-year transfer period. This year was chosen to represent the approximate time when a transfer could begin if development of the MWD-funded conservation facilities in IID were initiated in 1983.

Based upon the most recent estimates of available future MWD water supplies, a status quo scenario (no water transfer) was first identified. Metropolitan Water District's current predictions for the year 1986 indicate approximate usage of 1,200,000 AF of SWP water and 400,000 AF of Colorado River water, for a total import level of 1,600,000 AF/year (Metropolitan Water District of Southern California, 1979). These predictions by MWD constitute the benchmark of the analysis.

Utilizing the benchmark total import level of 1.6 MAF/year, five IID-MWD water transfer scenarios were examined in terms of their associated marginal costs: 30,000 AF/year, 200,000 AF/year, 300,000 AF/year, 350,000 AF/year, and 400,000 AF/year. In each case, it was assumed that the transferred Colorado River water would be utilized by MWD to replace water which otherwise would be imported from the State Water Project.

The marginal costs associated with individual transfer scenarios were specified within five major cost categories:

1. constructing water conservation facilities (and developing conservation programs) in the IID service area;
2. energy generation foregone at IID hydroelectric facilities;
3. energy generation foregone at Parker Dam on the Colorado River;
4. energy generation for MWD associated with increased imports from the Colorado River; and
5. increased salinity in the MWD service area.

The sum of these five categories of costs yielded the complete marginal cost for each of the proposed water transfer scenarios (Table 2). The estimated marginal costs range from $620/AF to $821/AF for the 20-year transfers.

What is the significance of these findings? In particular, what implications do the marginal cost figures hold for the Metropolitan Water District? Which, if any, of the proposed water transfers would be in the economic interest of MWD?

MARGINAL COSTS OF THE TRANSFERS COMPARED WITH MARGINAL COSTS OF ALTERNATIVE MWD SUPPLY AUGMENTATION PROGRAMS

The approach most frequently proposed by MWD for mitigating possible future water shortages continues to be the expansion of the State Water Project (Metropolitan Water District of Southern California, 1982). The most appropriate method of assessing an alternative water supply strategy is to compare the cost of the proposed alternative with the cost of expanding the State Water Project (SWP). The premise behind this analytical approach is that "if Southern California is prepared to invest a given dollar per acre-foot amount for new freshwater supplies, then logically it should be willing to invest less than that amount . . ." to receive water from an alternative supply (Orange and Los Angeles Counties Water Reuse Study, 1982c, p. 7-1). From the perspective of MWD, the appropriate economic decision criterion in assessing alternative investment strategies is thus to select those options (of balancing future water supply and demand) which have the lowest marginal costs per acre-foot.

Based upon a recent analysis by the California Department of Water Resources (1981b), accurate estimates were made of the marginal costs of undertaking the likely next stage of expansion of the State Water Project (SWP), namely the construction of the Thomes-Newville Diversion and Storage project and the Los Vaqueros Pump Storage facility. Also, based upon the same and other studies, the complete marginal costs of a number of additional alternatives were calculated: waste water reclamation (Orange and Los Angeles Counties Water Reuse Study, 1982a, 1982b, 1982c); ground water basin development (California Department of Water Resources, 1981b); and construction of a Peripheral Canal.

The marginal costs of the five water transfer scenarios may be directly compared with the marginal costs of the various alternatives open to the Metropolitan Water District of augmenting future water supplies (Table 3). The SWP-expansion alternative clearly is not an economically sound approach for MWD. All other approaches, including the proposed water transfers, have substantially lower costs. The first four water transfer scenarios, in particular, exhibit relatively low unit costs. The fifth water transfer scenario (which includes the lining of the All-American Canal), 400,000 AF/year, has marginal costs which are in the range of waste water reclamation projects being investigated in Southern California. Yet even this relatively expensive transfer option (No. 5, 400,000 AF/year) has annual marginal costs which are approximately 25 percent less than the unit costs of the SWP-expansion options (Figure 1).

At least four of the five water transfer scenarios ought to be financially attractive to the Metropolitan Water District. Hence, the management of MWD may be interested in appraising quantitatively the economic benefit which would accrue to the District as a result of entering into a transfer agreement with IID.

ECONOMIC BENEFITS TO MWD OF THE PROPOSED WATER TRANSFERS

If the water transfers would cost MWD less on an acre-foot basis than would expansion of the State Water Project (SWP), then it is reasonable to ask how much MWD is likely to save by entering into a transfer arrangement with IID.

Assuming an annual transfer on the order of 243,000 AF (the average of the incremental firm yield of Thomes-Newville and Los Vaqueros), MWD would save itself

TABLE 2. Marginal Costs of IID-MWD Water Transfers (1986 dollars).

	Water Transfer Scenarios (acre-feet/year)					
	T=30,000	T=200,000	T=300,000	T=350,000	T=400,000	
MWD Water Sources						
SWP (1,000 AF)	1,170	1,000	900	850	800	(A)
CRA (1,000 AF)	430	600	700	750	800	(B)
TOTAL MWD	1,600	1,600	1,600	1,600	1,600	(C)
Marginal Cost of Water Conservation Facilities in IID ($/AF)	21.54	38.47	47.70	52.31	176.94	(D)
Marginal Cost to MWD of Developing Conservation Facilities in IID ($/AF)	23.23	41.49	51.44	56.41	190.82	(E)
Energy Foregone at IID Hydroelectric Facilities						
kWh/AF	106	106	106	106	106	(F)
$/AF	45.60	45.60	45.60	45.60	45.60	(G)
Total Compensation from MWD to IID ($/AF)	68.83	87.09	97.04	102.01	236.42	(H)
Energy Foregone at Parker Dam						
kWh/AF	60	60	60	60	60	(I)
$/AF	11.32	11.32	11.32	11.32	11.32	(J)
MWD Service Area Energy Balance						
kWh/AF	2,000	2,084	2,133	2,157	2,182	(K)
$/AF	377.40	393.25	402.50	407.03	411.74	(L)
Marginal Cost of Increased Salinity in MWD Area ($/AF)	162	162	162	162	162	(M)
Estimated Marginal Cost of Transfer from IID to MWD	$620/AF	$654/AF	$673/AF	$682/AF	$821/AF	(N)

approximately $393/AF for the 20-year transfer. This represents annual savings to MWD on the order of $95 million (Table 4). Lastly, the total economic benefit of the transfers to MWD may be determined by calculating the (present value of the) savings which would accrue to the District as a result of entering into the proposed transfer agreements. The net savings to MWD over the period of the proposed water transfer would be more than $713 million for the 20-year transfer.

ASSESSING THE PROPOSED WATER TRANSFERS FROM THE PERSPECTIVE OF THE IMPERIAL IRRIGATION DISTRICT

Clearly, the Metropolitan Water District would benefit substantially from the proposed IID-MWD water transfers. But what about the Imperial Irrigation District? Are these transfers in its economic interest?

To assess the economic rationality of the transfers from IID's perspective, the marginal economic benefits to IID of the transfers may be contrasted with the economic gains which the District could realize by constructing the various conservation facilities on its own and thereby retaining full use of the conserved water. In other words, the marginal benefit to IID of entering into a transfer agreement may be compared with the marginal benefit foregone as a result of not keeping the water within the IID service area. Recalling that under the proposed transfer scheme MWD compensates IID for the costs of energy generation foregone, what remains to be considered is simply the agricultural benefit which may be foregone due to the transfer. Thus, if and only if the marginal benefit of a particular transfer scenario is greater than the expected net agricultural benefit ("marginal-value-in-use") of the water within the IID service area is that water transfer in the economic interest of the District.

The Imperial Irrigation District ought to choose to enter into a particular transfer arrangement only if the expected net marginal-value-in-use (in agriculture) of conserved water is less than the net marginal benefit which would accrue to the District as a result of that transfer. The marginal-value-in use (MVU), however, is not estimated in this paper.

TABLE 3. Marginal Costs of Water Transfers Compared with Marginal Costs of Alternative MWD Supply Augmentation Projects -- Waste Water Reclamation, Ground Water Basin Development, and Expansion of the State Water Project

MWD Water Supply Augmentation Alternative	Annual Yield (AF/year)	Marginal Cost (1986 dollars)
Waste Water Reclamation -- 23 Phase I Projects	[illegible]	[illegible]
Water Transfer Scenario No. 1A	[illegible]	[illegible]
Water Transfer Scenario No. 2A	[illegible]	[illegible]
Water Transfer Scenario No. 3A	[illegible]	[illegible]
Water Transfer Scenario No. 4A	[illegible]	[illegible]
Ground Water Basin Development -- Five Southern California Projects	[illegible]	[illegible]
Ground Water Basin Development -- Chino Basin	[illegible]	[illegible]
Waste Water Reclamation -- 43 Projects, All Phases	[illegible]	[illegible]
Water Transfer Scenario No. 5A	[illegible]	[illegible]
Thomes-Newville Diversion and Storage	[illegible]	[illegible]
Los Vaqueros Pump Storage	[illegible]	[illegible]

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[a] Based upon figures reported in Orange and Los Angeles Counties Water Reuse Study, 1982; [illegible] percent discount rate used in this study [illegible] dollars at 9 percent annual rate, and a "penalty cost" of [illegible] has been included to account for quality of reclaimed water, approximately 700 mg/L.

[b] Calculations are described in Table 2 of this paper.

[c] Based upon data found in California Department of Water Resources, [illegible] [illegible] (1986 dollars) for the period 1986-2035.

[d] Environmental externalities associated with these projects are not included in the calculated marginal costs, which thus underestimate the full (social) costs of these projects.

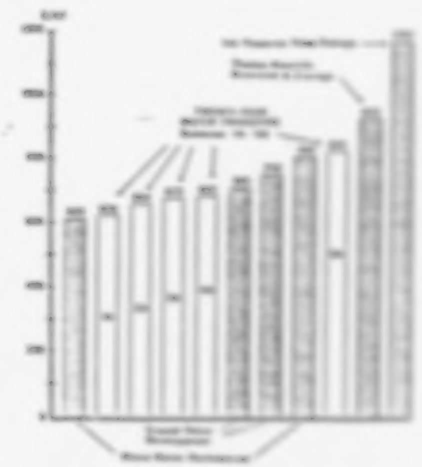

Figure 1. Marginal Costs of [illegible] Water Transfers Compared with Marginal Costs of Alternative MWD Supply Augmentation Projects.

Instead, the analysis utilizes a decision criterion which may be compared with any reasonable estimate of the MVU.

The relevant question for IID to ask itself is whether the expected marginal value in use of conserved water over the transfer period is greater than, equal to, or less than the marginal cost of the conservation facilities (annualized) over the same transfer period. In other words, how would the marginal economic return which IID might reap from growing additional crops on new lands (with water obtained through its own conservation investments) compare with the marginal costs of the conservation facilities as financed by MWD over the contemplated transfer period? This latter quantity is derived for the five transfer scenarios. These decision criteria range from a high of [illegible] to a low of [illegible] (Table 3).

How is Table 3 to be used to determine the prospective gains from transfers from IID's perspective? If the expected annual marginal value in use to IID of conserved water (on agriculture) is less for any specific transfer scenario than the figure found in column No. 2 or No. 3 of Table 3, then that transfer is indeed in the economic interest of the Imperial Irrigation District.

Which of the proposed transfers would be economically beneficial to IID? This question must be answered by IID itself, which can best estimate the marginal value in use of conserved water on new lands within its service area. [illegible]

TABLE 4. Economic Benefits to MWD of Proposed Water Transfers (1986 dollars).

	Annual Yield (AF/year)	20-Year Transfer	
Marginal Cost of SWP Expansion[a]			
Thomes-Newville Diversion and Storage	220,000	$925/AF	(A)
Los Vaqueros Pump Storage	265,000	$1,163/AF	(B)
Expected Cost: Weighted-Average	243,000	$1,055/AF	(C)
Marginal Cost of IID-MWD Water Transfer[b]			
Water Transfer Scenario No. 2	200,000	$654/AF	(D)
Water Transfer Scenario No. 3	300,000	$673/AF	(E)
Expected Cost: Linear Interpolation	243,000	$662/AF	(F)
Net Savings to MWD Per AF of Water[c] Transferred Per Year		$393/AF	(G)
Net Savings to MWD Per Year of Transfer[d]		$95,499,000	(H)
Net Savings to MWD Over Period of Transfer[e]		$713,324,397	(I)
NET SAVINGS TO MWD DUE TO TRANSFER[f]		$713 million	(J)

[a] Weighted-average is used to account for discrete nature ("lumpiness") of the projects under consideration.

[b] Linear interpolation is used because of the virtually continuous ("nonlumpy") nature of the proposed conservation facilities and practices.

[c] (G) = (C) – (F).

[d] (H) = (G) x 243,000 AF.

[e] Present value, using 12 percent discount rate.

[f] Figures from row (I), rounded to nearest million dollars.

TABLE 5. Benefits to IID of IID-MWD Water Transfers.

(1) Quantity of Water Transferred Per Year (AF/yr)	(2) Marginal Cost[a] of Conservation Facilities in IID Annualized Over 30 Years ($/AF/yr)	(3) Present Value[b] of Marginal Cost of Conservation Facilities in IID ($/AF)	(4) IID Decision[c] Criterion: Marginal Cost of Conservation Facilities Annualized Over Transfer Period (20 years) ($/AF/yr)
50,000 AF/yr[d]	176.94	1425.28	$191/AF
100,000 AF/yr[e]	52.31	421.37	$56/AF
200,000 AF/yr[f]	47.70	384.23	$51/AF
370,000 AF/yr[g]	38.47	309.88	$41/AF
400,000 AF/yr[h]	21.54	173.51	$23/AF

[a] From Table 2, row D. Blocks of water conservation facilities are cumulatively added in descending order of marginal costs because this part of the analysis is carried out from IID's perspective. When considering a conservation-transfer arrangement, IID would wish to begin with the most expensive conservation facilities and to include less expensive ones, in declining order of cost, as judged appropriate.

[b] From column No. 2, using a 12 percent discount rate over a 30-year time period.

[c] From column No. 3, annualized at 12 percent rate over 20-year period of proposed transfer, 1986-2005, and rounded to nearest dollar. Same figures are found in Table 2, row E.

[d] Includes lining of All-American Canal.

[e] Includes lining of All-American Canal plus limiting canal spills through construction of more regulatory reservoirs and expansion of electronic monitoring control.

[f] Includes items indicated in footnote (e), above, plus lining of main canals and laterals.

[g] Includes items indicated in footnote (f), above, plus expansion of use of tailwater recovery and improvement of on-farm irrigation techniques (with regard to leach water).

[h] Includes items indicated in footnote (g), above, plus expansion of seepage recovery systems.

the best available information regarding the likely productivity of new lands in the IID service area, however, it seems reasonable to conclude that several, if not all, of the proposed transfers would indeed be in the economic interest of the District.

IMPLICATIONS OF THE ANALYSIS

In conclusion, it is important to keep in mind that the quantitative economic analysis summarized in this paper is intended to be illustrative, not definitive. In particular, the 20/10-year split of MWD/IID usage of conservation facilities was chosen as one example to demonstrate the way in which an IID-MWD water transfer plan ought to be analyzed from the economic perspectives of both parties to such a transaction.

Overall, the numerical results of the marginal cost analysis should not be taken as indications of precise dollar amounts which ought to be paid for the transferred water. Rather, the calculations which led to those results are meant to indicate, at the least, the factors which need to be taken into account in the process of negotiating an IID-MWD water transfer.

Such negotiations might well lead to an arrangement whereby at the conclusion of a transfer period, IID would have an option of either repaying MWD (possibly without interest) for its conservation expenditures and acquiring the conserved water for its own use, or alternatively not repaying MWD and thus allowing it to continue to receive the conserved water.

Given the caveats expressed above, the economic analysis presented in this study clearly indicates that several, if not all, of the proposed transfers would bring substantial economic benefits both to MWD and to IID. It is thus reasonable to conclude that if a transfer program is combined with the implementation of conservation measures within the IID service area, water transfers from IID to MWD will be technically feasible and economically beneficial, both for the "seller" of the water, the Imperial Irrigation District, and its "buyer," the Metropolitan Water District of Southern California.

ACKNOWLEDGMENTS

This paper is based upon research conducted at the Environmental Defense Fund in Berkeley, California, by Thomas J. Graff, Daniel Kirshner, Charles Cornwall, Nancy Marks, Robert Bergstrom, and the authors. Partial funding was provided by The Wallace Alexander Gerbode Foundation and the Ernst D. van Loben Sels-Eleanor Slate van Loben Sels Charitable Foundation. The authors, however, are responsible for any remaining errors.

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Business Day
The New York Times
WEDNESDAY, AUGUST 3, 1988

Economic Scene | Peter Passell

A Free Market In Water Rights

IN the central valleys of California, farmers pay as little as $10 to irrigate an acre of cotton. A few hundred miles away in Los Angeles, local authorities pay as much as $600 for the same amount of water — roughly a year's supply for three families.

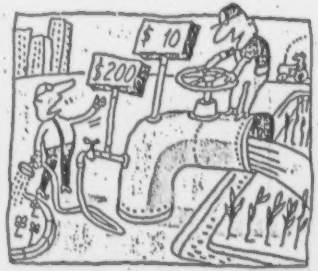
To residents of the rapidly growing desert cities of the Southwest, such gaping disparities in the price of water are symbols of farmers' greed and privilege. But to the Environmental Defense Fund, the most economically sophisticated environmental lobby, the big price differences represent an opportunity. They are evidence, argues Tom Graff, the fund's legal counsel, that urban water demands can be met at little cost to agriculture or to the environment. What's needed, he argues, is a free market in water rights, giving farmers a financial stake in water conservation.

• • •

California seems to be running out of affordable, environmentally benign sources of water. Many of the state's rivers are already dammed. Underground aquifers are overtaxed. So much water has been diverted from streams entering San Francisco Bay that salt water is backing into surrounding marshes and farmland. Adding to Californians' anxieties, Arizona will soon reclaim its right to Colorado River water now keeping lawns green for some 500,000 families in the Los Angeles sprawl.

Look more closely, though, and it is clear there would be plenty to go around from existing sources if water were used more efficiently. Just 17 percent of California's water is used by urban residents. Much of the remaining 83 percent is wasted by farmers who have no incentive to conserve.

Take, for example, the Imperial Irrigation District. Its 1,600 miles of canals distribute Colorado River water to 450,000 acres of alfalfa, vegetables and sugar beets. Lining the 90-year-old earthen canals with concrete, and drilling wells to recapture seepage, would replace almost half the water to be diverted to Arizona. Simple changes in individual farmers' irrigation methods, plus retirement of marginally productive land, might save enough to replace the other half.



Nicolae Asciu

Why has it not happened? While much cheaper than taming and transporting river water, conservation is not free. And as long as they have enough water to irrigate their own crops, farmers have little incentive to save water that costs them just 3 cents for a thousand gallons.

State and Federal authorities provide the water at incredibly low prices. Could they not insist on a reasonable conservation effort? Southern California's Metropolitan Water District is willing to pay for lining the All-American Canal, which links the Colorado with the Imperial Valley, in return for rights to all the water saved. And they are pressing Congress to legislate the deal.

Conservation and transfer by Government fiat are now possible in cases of blatant waste because political power in the West is tipping in favor of cities. But, as Mr. Graff argues, political solutions may undermine prospects for voluntary transfers that would yield still cheaper water for urban areas.

If clear ownership rights were assigned to the owners of irrigated land, he points out, farmers would figure how much water they really needed and sell the rest. Since there is vast potential for cheap on-farm conservation, Mr. Graff guesses that the market price would probably settle in the range of 10 cents for a thousand gallons. That's roughly triple the cost to most California farmers but less than half the amount the Metropolitan Water District would have to shell out for water saved from the All-American Canal.

In Idaho a state water bank has promoted private transfers, with active leasing of water stored in government reservoirs. And in Colorado, environmentalists offer a convincing case that it would be cheaper for Denver to buy available water rights than to dam the scenic South Platte River. In most of the West, however, transfers are inhibited by fears of legal challenge.

• • •

Federal law and the laws of most states are silent on the question of the private right to profit from sales of water supplied by the Government. Even where the law is clear, there may be problems in assigning rights now shared communally. The bylaws of irrigation districts, for example, may force authorities to divide the benefits of one farmer's conservation effort among all members.

Not everyone, moreover, is sure that market-based distribution of water would serve environmental interests. Conservation would certainly reduce the pressure for dam-building. And it would probably shrink the total acreage in crops, reducing polluting runoffs from irrigated land. On the other hand, it would also give farmers a financial incentive to divert water that allows fish to breed and protects wetlands from salinization.

Free markets in water are coming, if only because the alternatives for water-scarce cities are so limited. The challenge, yet to be taken up by government, is to set rules that will both protect public uses of water and create a sense that private transfers are fair as well as inevitable.

The New York Times

National Edition

Northern California: Heavy rain, windy on coast from Cape Mendocino north. Elsewhere, showers later. Snow above 4,000 feet in Sierra Nevada. Weather map, forecasts for other areas, page B5.

TUESDAY, NOVEMBER 22, 1988

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IN THE NATION

Tom Wicker

Alternative To a 'Dead Sea'

One "mandate" that George Bush and Congress share is to protect the environment. On this vital issue, Congress has been prone to write laws and regulations, some of them successful. The President-elect may have other ideas.

His counsel, C. Boyden Gray, insists that Mr. Bush intends to "take seriously" the environmental promises he made in his Presidential campaign. But he'll rely, Mr. Gray said, on "market incentives" — fees, pollution trading rights and the like.

Mr. Bush was a Vice President who usually said nothing while the Reagan Administration *did* nothing to preserve the environment. Do "market incentives" mean that the President-elect intends to grant "licenses to pollute," rather than fight polluters?

Not necessarily. The idea of economics as the partner rather than the enemy of the environment is finding favor, nowadays, among environmentalists themselves. That way, they argue, lie reduced cleanup costs, more equitable sharing of those costs and less political strife leading to deadlock between polluters and those adversely affected.

A recent bipartisan report by Senators Tim Wirth, Democrat of Colorado, and John Heinz, Republican of Pennsylvania, recommended a variety of credits, permits, taxes, exchanges, deposits and other devices for tackling environmental problems — with less controversy, they contended, and better results.

Tom Graff and Zach Willey, senior officials of the Environmental Defense Fund based on the West Coast, are engaged in a striking effort to use incentives in this way. If their proposal takes hold, the unique ecosystem of Mono Lake will be preserved, the water problems of Los Angeles will be eased and some California farmers will be able to grow crops more efficiently with less water.

Mono Lake, situated just east of Yosemite National Park, is three times saltier and far more alkaline than the ocean, which led Mark Twain to call it "the Dead Sea of California." He was wrong; Mono supports a huge population of brine shrimp and flies, which in turn provide food for more than 80 bird species that nest on the lake's shore and islands.

Streams from the Sierra Nevada feed Mono, which has no outlet. In 1940, its surface was 6,400 feet above sea level; but that year Los Angeles began diverting water from the feeder streams. The lake has been drying up ever since, losing about half its volume and doubling its salinity; its surface is down to 6,377 feet. If nothing is done by the year 2012 — which is only half as many years as Los Angeles has already been diverting the water — Mono's level will have dropped to 6,352 feet, too low for its ecosystem to survive.

Los Angeles needs the water — 70,000 acre-feet a year, or about 10 percent of the city's consumption in 1987. But the U.S. Forest Service has issued a non-binding call for Mono's surface to be maintained between its current level and 6,390 feet, to preserve the lake's islands, ecosystem and "scenic grandeur." That would require about 75 percent less water to be diverted to Los Angeles — reductions that would have to be replaced even if the city's population stopped rising.

How will Bush use 'market incentives' on issues of the environment?

Mr. Graf and Mr. Willey were retained by the Los Angeles water department and by Mono Lake preservationists to find a way to meet both Forest Service and city requirements. They propose that California farmers suffering subsurface drainage problems lease irrigation water to Los Angeles to make up the city's losses from reducing its Mono Lake diversions.

Subsurface drainage problems result from irrigation water collecting below ground and rising, bringing up salts and other chemicals into the root zones of farm crops. Farmers could use funds from the water leases to install new drainage or irrigation systems allowing them to grow more with less irrigation.

Whether the city and preservationists will agree to this scheme is now being determined; if they do, whether enough farmers will subscribe should be known in a month or two. Failure could bring drastic results: Mono Lake a real "Dead Sea," or drastic conservation measures in Los Angeles, or protracted litigation as the city seeks the needed water from other, bitterly protesting areas — the kind of unproductive strife that incentive-based environmentalism seeks to avoid.

But it's not only domestic problems that the environment poses, as another article will detail. If George Bush really is an environmentalist, all of our battered globe demands his attention. □

Senator **Bradley**. Our next witness is Mr. Nathaniel Bingham of the Pacific Coast Federation of Fisherman's Associations. Welcome to the Subcommittee, Mr. Bingham.

STATEMENT OF NATHANIEL S. BINGHAM, PRESIDENT, PACIFIC COAST FEDERATION OF FISHERMAN'S ASSOCIATIONS

Mr. **Bingham**. Thank you very much, Mr. Bradley, Mr. Fazio and the Committee. I want to thank you for the opportunity to present testimony this morning. I am actually a working commercial fisherman, this is not the arena I usually find myself in, but I'll try to do the best I can.

Senator **Bradley**. Please bring the microphone close, relax, and everyone here is very anxious to hear your testimony. You are offering us one of the really unique perspectives on this issue.

Mr. **Bingham**. Thank you very much. I wish to thank the Subcommittee for being here today to take the testimony. My testimony today reflects the positions of myself and PCFFA. I'll first discuss the nature and extent of the damage done to California's fisheries by the Central Valley Project. Second, I will give you our perspective on three proposals that have been put forth affecting the allocation of California's water and the future of the Central Valley Project. Finally, Mr. Chairman, I will address the questions you have put forward regarding the future operation of Federal water projects in California.

The cost and benefits of Federal water exploitation programs in California do not fall evenly across our people. The Federal Central Valley Project has heavily benefitted irrigators, particularly in the San Joaquin Valley. The direct costs have been borne by the Federal taxpayers and the indirect costs have been borne by the users and trustees of the public trust resources, including fish and wildlife of national and international significance.

Just how extensive is the damage? Consider the salmon habitat of the great Central Valley rivers and their tributaries. Where there once existed 6,000 miles of spawning habitat, by the mid-1970's there was less than 300 miles of spawning habitat, a 95 percent loss.

The operation of Friant Dam, which began 40 years ago, totally wiped out the San Joaquin salmon run on the mainstem of that river. This run averaged 140,000 spawners annually. That run, were it alive today, would provide one half million fish a year to commercial fishermen and recreational anglers.

At today's prices the annual value of that run alone could have approached $50 million. Despite passage of the Federal Fish and Wildlife Coordination Act in 1934, the Bureau refused to release any water whatsoever from that dam for fish. The Bureau has also refused to provide a fish hatchery or any form of mitigation for this massive fish loss.

At the same time, the Bureau began the operation of Shasta Dam on the Upper Sacramento. This dam has blocked access to over 200 miles of prime salmon spawning areas. They built a hatchery to somewhat compensate for the loss. The hatchery has only mitigated a fraction of the losses caused by the Shasta and Keswick operations and presently is in need of millions of dollars in renovations.

The problems at Shasta did not end with the losses of habitat and consequent losses of fish above the dam or the failure to adequately mitigate those losses. In recent years, as the result of the increasing drawdown of Shasta Reservoir to meet irrigation demands in the San Joaquin Valley, there has been a problem with hot water releases from the dam into the river. This is an acute problem in the late summer and early fall when temperatures in the river above 56 degrees can be lethal to salmon spawners or eggs and fry.

Cool water is available from the base of the dam, but the Bureau has refused under most circumstances to provide this water available when it is needed. The Bureau is now proposing to make modifications to Shasta Dam that would permit power generation while allowing cool water releases in the autumn and warm water releases in the spring. The cost of this mitigation should be borne by the CVP beneficiaries.

Further down the river, in the early 60's the Bureau began the operation of the Red Bluff Diversion Dam. The operation of this dam has had the effect of eliminating the use of the best spawning areas left in the river, that area between Red Bluff Diversion Dam and Keswick. The fish ladders do not work. For the progeny of those few spawners that were able to get past the dam, the downstream migration was even more perilous.

The Red Bluff Diversion Dam, as a result, is a major fish killer. This is ironic since the cost of the dam was justified on the basis of salmon enhancement—that is, its Tehama-Colusa Spawning Channel that has never worked.

Since the operation of Shasta and the Red Bluff Diversion Dam began, salmon populations in the Sacramento River have declined fourfold. The Sacramento winter run king salmon population, which historically had as high as 130,000 spawners, declined to 547 spawners this year. With a quote, "stabilized" run of 2,000 spawners two years ago, the Bureau and the National Marine Fisheries Service devised a 10-point program in an effort to avoid listing the run as threatened, a dubious action, since the returning spawners were still faced with hot water, low flows and passage problems. They failed to address the habitat problems that led to the decline.

The winter run has now been listed as an endangered species under California's Endangered Species Act, and finally, as threatened under the Federal Endangered Species Act.

What this may bring to pass is that it may result in further regulation of the ocean salmon fisheries, which I'm dependent upon for livelihood, as an effort to address these very low numbers of spawners that wish to return to the river. And this is really ironic. And we're going to be the people that are going to feel the impact.

Hot water and low flow problems have also affected the American River runs of king salmon. The runs on the American, a major tributary of the Sacramento, have declined in recent years as a result of the Bureau's operations of Folsom Dam.

Salmon has not been the only fishery impacted by the Bureau's operations on the Sacramento-San Joaquin system. Steelhead and trout populations have dropped by 90 percent in the San Joaquin and 80 percent in the Sacramento. In the Delta, striped bass populations have declined due to the massive diversions. The striped bass index during the period of 1922 to 1968 was 106. This year the index was 5.2.

The Central Valley Project impacts have not been limited to the Central Valley, although the benefits from the project have been there. The Trinity River, the major salmon producing tributary of the Sacramento of Klamath River, has been plumbed into the Sacramento River as a result of the Trinity Unit of the Central Valley Project.

The Klamath system is the second largest salmon producing river system in California, after the Sacramento-San Joaquin system. Until 1981, as much as 86 percent of the flow of the Trinity was being diverted into the Central Valley Project. The operation of the Trinity Unit has resulted in losses of spawning areas above Lewiston Dam, as well as the destruction of spawning and nursery habitat below the dam, due to flow reductions. There have been some improvements made on the Trinity as a result of the Secretary of Interior's decision in 1981 increasing the flows in the Trinity from 119,000 acre feet to 340,000 acre feet.

That decision, issued by then-Secretary of the Interior, Cecil Andrus, restored part of the Trinity's flow. It is our fear that after that period, even if it is documented that additional flows would benefit the fishery—and I would add that we have seen significant returns of fish to that river system since those flows came back—that the Bureau will then sell this water to the San Joaquin Valley agribusiness on or before the completion of the 12-year study ordered by Secretary Andrus.

The impacts on the Klamath stocks have affected commercial, sport and tribal fishermen alike. In fact, much of our ocean fishery is regulated for the Klamath River and commercial fish catches on the North Coast that once averaged 250,000 fish or more each season have now been reduced to less than 30,000 fish this year. This is to meet conservation needs and also to share the resource of the tribal interests in the rivers.

It is unfortunate that the Hoopa Valley tribe wasn't invited to be on this panel, because they have some important points to make about the impacts of Central Valley Project water on their Tribal rights. I would urge that the Subcommittee pay particular attention to their written testimony, which they have submitted.

It would not be accurate to blame all of the declines on California salmon fishery on the Bureau of Reclamation and the Central Valley Project, but certainly the lion's share of these declines are the Bureau's responsibility. While California's salmon fishermen have been regulated for over 130 years, the Bureau has been allowed to operate with virtual impunity, destroying the runs the fishermen depend on for their livelihoods.

And as the Bureau has destroyed more, the restrictions on the fishermen have continued to increase.

Last Wednesday I listened to many of my fellow fishermen plead with their Congressman, Doug Bosco, for some form of relief this year. We've had a terrible season, there are fishermen who literally do not know how they're going to be able to feed their families this winter.

The Federal Government has destroyed much of their fishery, then implemented regulations to assure that they would be unable to catch the harvestable amount left. Many of these fishermen will be unable to meet their boat mortgage, their home mortgages this year.

Many do not know how they will make it through the winter. I know it's going to be tough for me. These are hard-working small businessmen. They take risks daily to bring to market a product that is nutritious, that enjoys worldwide demand, that needs no Federal subsidy. They have given their time and their money to protect and restore as best they can, salmon stocks. They have not asked for subsidies. In fact, through our stamp program, we're giving up part of our livelihood to rebuild salmon stocks in both the Central Valley and the North Coast. And they sure as hell haven't made millions from subsidized water.

I now want to touch on three concepts that have been proposed as solutions——

Senator **Bradley**. If you could summarize those, we'd be grateful, so that we can——

Mr. **Bingham**. Sure. Okay, under water marketing, we would caution, in the rush to market water as the hot new bankable commodity, let's not forget that this water has been made available at the cost of fishermen's livelihoods. We're not really very supportive of that concept.

Cost sharing, the fishing industry is being asked to pony up the cost for the damages to the fish resources that were done historically. When fisheries are rebuilt to historic levels, we do stand ready to share costs, but I don't think we should be asked to help share the cost to rebuild the damage that's been done to us.

Under divestiture, we don't want to see the Bureau go away from California until it's fixed—the damage is done.

Our recommendations relative to the questions you've asked would be that we believe that the Central Valley Project should be reauthorized, so that fish and wildlife impacts can be adequately addressed. I don't think that it's sufficient for the Bureau to talk about a new mission in press releases without definite marching orders from Congress to get in there and fix what's broken.

Thank you very much for the opportunity to testify. I'd be happy to answer any questions.

Senator **Bradley**. Thank you, Mr. Bingham.

[The prepared statement of Mr. Bingham follows:]

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STATEMENT OF NATHANIEL S. BINGHAM, PRESIDENT PACIFIC COAST FEDERATION OF FISHERMEN'S ASSOCIATIONS

to the

UNITED STATES SENATE SUBCOMMITTEE ON WATER & POWER RESOURCES

REGARDING FEDERAL WATER POLICIES IN CALIFORNIA

Sacramento, California
29 August 1989

Good morning Mr. Chairman and members. My name is Nat Bingham. I am a commercial fisherman operating my vessel out of Fort Bragg, California. I am the president of the Pacific Coast Federation of Fishermen's Associations, also known as PCFFA. Ours is an umbrella organization of associations representing working men and women in the west coast fishing fleet. Through its member associations, PCFFA represents, among others, all of California's organized commercial salmon fishermen. I am also chairman of the Pacific Fishery Management Council's Salmon Advisory Subpanel and I am a member of the California Salmon Trollers Advisory Committee, created by the state legislature to oversee the expenditure of an industry-sponsored tax, known as the salmon stamp, for funding salmon restoration programs.

STEWARDS OF THE FISHERIES

I wish to thank the subcommittee for being here today to take testimony on the impacts federal water programs -- that is, the Central Valley Project -- have had on California's fish resources and fishing industry. My testimony today reflects the positions of myself and the PCFFA. I will first discuss the nature and extent of the damage done to California's fisheries by the CVP. Second, I will give you our perspective on three proposals that have been put forth affecting the allocation of California's water and the future of the CVP. Finally, Mr. Chairman, I will address the questions you have put forward regarding the future operation of federal water projects in California.

There should not be any awkwardness in complaining about federal policies and programs to federal lawmakers. "Bureau bashing" was probably coming into vogue by the second year of our Republic. It strikes me as a bit ironic, nonetheless, that we should come here today to complain about federal water and power operations in California considering how **heavily** the state has lobbied Congress for these very programs.

The answer, or course, is that the costs and benefits of federal water exploitation programs in California do not fall evenly across our people. The federal Central Valley Project has heavily benefitted irrigators -- particularly in the San Joaquin Valley. The direct costs have been borne by federal taxpayers and the **indirect** costs have been borne by the users and trustees of public trust resources, including fish and wildlife of national and international significance.

Federalism, as I understand it, leaves to the states responsibility for those endeavors conducted best by the states. I think it is significant that, while the Reclamation Act dates from 1902, California did not become involved with federal reclamation until 1935. If it had not been for the Depression, Reclamation would probably not have been invited here at all.

So, Reclamation was invited here briefly for a little Depression relief -- and it stayed. It stayed long enough to finish Friant Dam -- and to destroy great runs of spring and fall king salmon from the San Joaquin River. It stayed long enough to parch and pollute the important waterfowl habitats of the San Joaquin Valley. Reclamation stayed another 25 years to divert the Trinity and to destroy 90 percent of the salmon and steelhead of that great River. It stayed long enough to damage the estuary of San Francisco Bay, the most important estuary on the west coast of North **and** South America -- and to lay plans for further damage.

Just how extensive is the damage? Consider the salmon habitat of the great Central Valley rivers and their tributaries. Where there once existed 6,000 miles of spawning habitat by the mid-1970's there was less than 300 miles -- a **95 percent** loss.

The operation of Friant Dam which began 40 years ago totally wiped out the San Joaquin salmon run on the mainstem of that river. This run averaged 140,000 spawners annually. That run, were it alive today, would provide one half million fish a year to commercial fishermen and recreational anglers. At today's prices the annual value of that run alone could have approached $50 million. Despite passage of the federal Fish & Wildlife Coordination Act in 1934, **the Bureau refused to release any water whatsoever from the dam for fish. The Bureau refused to provide** a hatchery or **any form of mitigation for this massive fish loss.** Parenthetically, the Bureau during the first fifteen years of Friant operations did not even have a state water right to divert the San Joaquin flows ("We don't need no steenking permits"?).

At approximately the same time, the Bureau began the operation of Shasta Dam on the Upper Sacramento. This dam blocked access to over 200 miles of prime salmon spawning areas in the upper reaches of the river and the Pit and McCloud River and Squaw Creek tributaries. The Bureau's idea of mitigation for fish losses was to foist the mitigation hatchery -- the Coleman National Fish Hatchery on Battle Creek, a tributary of the Sacramento, on its sister agency -- the U.S. Fish & Wildlife Service. The Bureau did not provide funding for this hatchery, either from its own budget or revenues generated from water and power sales, but instead left Fish & Wildlife to fend for itself in the federal budget process. Indeed, the Bureau for most of the history of that hatchery refused to provide the Fish & Wildlife Service with power at the reduced rates it sold power to its other customers. The hatchery has only mitigated **a fraction** of the losses caused by the Shasta and Keswick operations and presently is in need of millions of dollars in renovations.

The problems at Shasta did not end with the losses of habitat (and consequent losses of fish) above the dam or the failure to adequately mitigate those losses. In recent years, as the result of the increasing drawdowns of Shasta Reservoir to meet irrigation demands in the San Joaquin Valley, there has been a problem with hot water releases from the dam into the river. This is an acute problem in the late summer and early fall when temperatures in the river above 56 degrees can be lethal to salmon spawners or eggs and fry.

Cool water is available from the base of the dam, but the Bureau has refused to make this water available when it is needed. The reason it has refused to provide this water is that it loses power generation, since the outlet at the base of the dam does not flow through a generator. The Bureau is now proposing to make modifications to Shasta Dam that would permit power generation while allowing cool water releases in the autumn and warm water releases in the spring. The cost of this mitigation project should be borne by CVP beneficiaries.

Further down the river, in the early 1960's, the Bureau began operation of the Red Bluff Diversion Dam. The operation of this dam had the effect of eliminating the use of the best spawning areas left in the river -- that area between Red Bluff Diversion Dam and Keswick. The fish ladders did not work. For the progeny of those few spawners that were able to get past the dam, the downstream migration was even more perilous. In the maelstrom at the base of the dam, the baby salmon fall easy prey to a population of squawfish that have bloomed there feeding on those fish injured, confused or stunned in passing the dam.

The Red Bluff Diversion Dam is, as a result, a major fish killer. This is ironic since the cost of the dam was justified on the basis of salmon enhancement -- that is, a Tehama-Colusa Spawning Channel that has never worked.

Since the operation of Shasta and the Red Bluff Diversion Dam began, salmon populations in the Sacramento River have declined four-fold. The Sacramento winter-run king salmon population, which historically numbered 120,000 spawners, declined to 547 spawners this year. With a "stabilized" run of 2,000 spawners two years ago, the Bureau and the National Marine Fisheries Service devised a "10-Point Program" in an effort to avoid listing the run as threatened. While the agencies succeeded in closing the in-river sport fishery (a dubious action, since the returning spawners were still faced with hot water, low flows and passage problems) they failed to address the habitat problems that led to the decline. The winter run has now been listed as an endangered species under California's Endangered Species Act and, finally, as threatened under the federal Endangered Species Act.

The spring-run Sacramento king salmon population is now in a precarious situation and may be the next species listed. This year the Bureau has proposed water releases from the combined Trinity River and Shasta operations into the Sacramento River that will result in 63 degree temperatures in September -- the month when the spring-run will be spawning. The Bureau and the California Department of Fish & Game have also proposed a flow regime (to combat a waste heat discharge order imposed last spring by the

Central Valley Regional Water Quality Control Board) that could result in a loss this year of up to 70 percent of the fall-run king salmon. These fish are the mainstay of our commercial and recreational fisheries. These losses would not occur but for the fact that the Bureau is seeking to maximize power generation and water deliveries.

Hot water and low flow problems have also affected the American River runs of king salmon. The runs on the American, a major tributary of the Sacramento, have declined in recent years as a result of the Bureau's operations of Folsom Dam. A combination of warm water and sudden drops in river flow wiped out last year's run on the American. This included both the natural spawning stocks, as well as the stocks at Nimbus Hatchery.

Salmon has not been the only fishery impacted by the Bureau's operations in the Sacramento-San Joaquin system. Steelhead and trout populations have dropped by 90 percent on the San Joaquin and 80 percent on the Sacramento. In the Delta, striped bass populations have declined due to the massive diversions. The striped bass index during the period of 1922-1968 was 106. This included the time when there existed a commercial fishery on this species (up to 1934). **This year the index is 5.2.**

The Central Valley Project impacts have not been limited to the Central Valley (though the **benefits** from the project have been there). The Trinity River, the major salmon spawning tributary of the Klamath River, has been plumbed into the Sacramento River as a result of the Trinity Unit of the CVP. The Klamath system is the second largest salmon producing river system in California, after the Sacramento-San Joaquin system. Until 1981, as much as 86 percent of the flow of the Trinity was being diverted into the CVP. The operation of the Trinity Unit has resulted in losses of spawning areas above Lewiston Dam as well as the destruction of spawning and nursery habitat below the dam due to the flow reductions. There have been some improvements made on the Trinity as a result of a Secretary of Interior's decision in 1981 increasing the flows into the Trinity from 119,000 acre-feet to 340,000 acre-feet. That decision, issued by then-Secretary of Interior, Cecil Andrus, restored part of the Trinity's flow until 1993. It is our fear that after that period, even if is documented that additional flows would benefit the fishery, that the Bureau will sell this water to San Joaquin Valley agribusiness on or before the completion of the 12-year study ordered by Secretary Andrus. The impacts on the Klamath stocks have affected commercial, sport and tribal fishermen alike. In fact, much of our ocean fishery is regulated for the Klamath River and commercial fish catches on the north coast that averaged 250,000 fish or more each season were reduced to less than 30,000 fish this year.

It would not be accurate to blame all of the declines of California's salmon fishery on the Bureau of Reclamation and the Central Valley Project. But, certainly the lion's share of these declines are the Bureau's responsibility. While California's salmon fishermen have been regulated for over 130 years, the Bureau has been allowed to operate with virtual impunity -- destroying the runs the fishermen depend on for their livelihoods. And, as the Bureau has destroyed more, the restrictions on the fishermen have continued to increase. **The fisherman's dilemma** is, in part, with a system of fishery and water agencies that fret about water deliveries and power generation and cut the heart out of the fish stocks and the income of fishermen.

The past three years the Bureau has made **full** deliveries of water to its agribusiness customers in the Central Valley to grow their federal price-supported and subsidized crops. For the salmon it has been three years of drought and fishermen are feeling it deeply this year.

It is simply unconscionable, to me, that Central Valley agribusiness interests should receive full deliveries of subsidized water in dry years when salmon fishermen are not allowed to fish enough to feed their families.

Last Wednesday, I listened to many of my fellow fishermen plead with their congressman, Doug Bosco, for some form of relief this year. The federal government destroyed much of their fishery, then implemented regulations to assure that they would be unable to catch the harvestable amount left. Many of these fishermen will be unable to meet their boat mortgages, their home mortgages this year. Many do not know how they will make it through the winter. I know it will be tough for me. These are hard working small businessmen. They take risks daily to bring to market a product that is nutritious, that enjoys world-wide demand, that needs no federal subsidy (unlike cotton or rice). They have given their time and their money to protect and restore, as best they can, salmon stocks. They have not asked for subsidies. And they sure as hell haven't made millions from subsidized water. None of us were invited to Malcolm Forbes' birthday party.

The Central Valley Project has made millionaires in the San Joaquin Valley, at the same time is has destroyed fish and wildlife populations and made paupers of fishermen.

I now want to touch on three concepts that have been proposed as "solutions" to the problems we are faced with by water allocation and Bureau operations. What I want to tell you here is "beware".

Water Marketing

A number of water "reformers" have advocated recently that the way to assure the "highest and best" use of water would be to allow those having water "rights" to be able to sell them. The theory goes that farmers growing low value crops will be willing to sell out to municipalities and others willing to buy that water. From a public policy standpoint we have a problem with the notion of granting to those taking a public resource -- water -- under a usufructuary right, and then their being able to sell it. This is particularly troublesome when that water came to them as a result of a federal subsidy.

It should be remembered that water in California tends to flow uphill towards money. Thus, making it a salable commodity may not insure that it is put to the best use for society and the environment, but only that the highest bidder will prevail. Water marketing will not assure that a family farmer will be able to compete in the bidding with agribusiness for the water. Water marketing will not assure that middle and lower income communities will be able to compete with the wealthy enclaves of row castles for the water. Water marketing will not assure that fish and wildlife, also public resources, will be able to compete in the bidding for water with golf courses in the desert and other highly consumptive uses for the wealthy. It is my belief that water marketing will simply increase the growing disparity between the haves and the have-nots in this nation.

In the rush to market water as the hot new bankable commodity, let us not forget that this water has been made available at the cost of fishermen's livelihoods. Water marketing, in fact, is the worst idea to come along since the decision to deregulate the Savings and Loan institutions.

Cost Sharing

The Bureau of Reclamation to its credit has begun to address some measures to restore some of the fish and wildlife that its operations over the past 40 years have decimated. To do this, they have advocated some form of cost sharing. We do not object to cost sharing per se -- where it is reasonable to do so. We do, however, object to the type of cost sharing being proposed now by the Bureau.

It is being proposed that fishermen share the costs for fish flows and maintaining temperature controls; to share the costs for lost power and screening. These measures -- flows, temperature controls, screening -- address damage done to the fishery by water development. Asking fishermen to participate in the cost of them is like asking the victim of a crime to cost share in his restitution. Let's not forget that fishermen and fish and wildlife users are the victims of the Central Valley Project, not the beneficiaries.

The victim of a broken nose should not have to pay for fixing that nose. The cost sharing should be borne by the thugs that caused the broken nose. Likewise, fishermen should not be asked to pay for the repairs to the fishery that was broken by others.

The State of California has adopted a state policy to increase its salmon resource to historic levels. That commitment is reflected in the passage of Senate Bill 2261 in last year's session of the Legislature. As we get the fish above historic levels we stand ready to share the costs of **enhancement**. Already with our salmon stamp program we are making a significant contribution towards accomplishing the goal.

I guess what I'm saying Mr. Chairman is that we would pay for a nose bob, but we won't pay for fixing a thug-broken nose.

Divestiture

We are now hearing that the Bureau of Reclamation wants to sell the CVP to local interests, pack up, move to Denver, change its spots and become an environmental management agency. We say, "hold on, you're not going anywhere until you clean your room".

The Bureau has also sought to sell off a "remaining" 1.5

million acre-feet of water that it may or may not have from the CVP. It is seeking to do this before the State Water Resources Control Board issues its decision on flows that will be needed to protect the San Francisco Bay and Delta. The State Senate has responded and passed Senate Joint Resolution 26 calling for a halt of this sale. The Bureau should not be allowed to divest itself of any water it may still have, no more than it should be allowed to sell off its operations, when that water may be needed for the protection of fish and wildlife

The Bureau of Reclamation cannot be allowed to slip away to the Rockies in the middle of the night. It has some unfinished business here in California. That business is fixing the damage it has caused to our fish and wildlife. It should not be allowed to leave until the damage to the fish and the fishermen has been repaired.

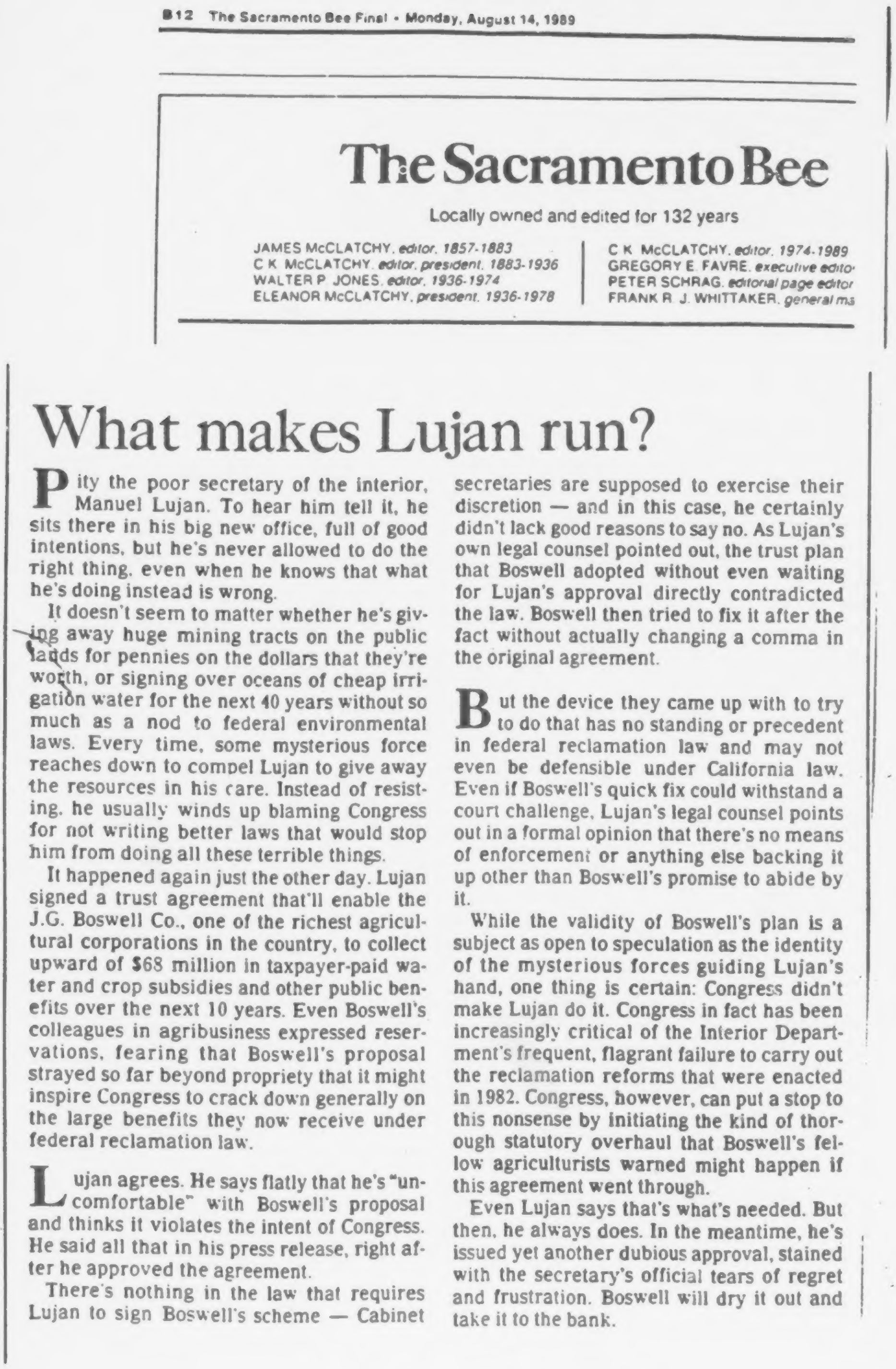
Recommendations

This brings me, Mr. Chairman, to recommendations for improving federal water operations here in California. With specific regard to the questions you have raised in your letter about the Bureau's preparedness to carry-out its self-anointed environmental mission, it is our position that the Bureau is neither authorized for, nor inclined toward such a mission. It is clear to us therefore that the answer lies in straightforward Congressional reauthorization of the Central Valley Project to include fish and wildlife conservation as full project purposes.

It is our understanding that such a reauthorization would require that the costs of providing those benefits of a strictly local nature would be repaid by local beneficiaries in the same manner that irrigators are **supposed** to repay their project services. Similarly, those benefits of widespread or national interests, such as salmon conservation or migratory waterfowl protection, would be non-reimbursable project costs in the same manner that flood control benefits, for example, are regarded non-reimburseable today. It is also our understanding that the effects of reauthorization, including the costs and benefits, were studied thoroughly by the Department of the Interior in the 1970's and the matter was brought virtually to completion, ready for Congressional consideration and that it was snuffed by the Reagan Administration.

It is not enough that the Bureau has adopted a "new mission" in its press releases. We need to see such a mission in actions, in fact. Despite, its claims of environmental sensitivity, fishermen and conservation organizations have had no success in getting the Bureau to prepare an Environmental Impact Statement prior to the renewal of the Friant Unit contracts. While we have neither the time nor the resources for litigation, we have finally found it necessary to sue the Bureau to get them to follow the National Environmental Policy Act. Fish and wildlife conservation must, therefore, be made a specific project purpose in the reauthorization.

Thank you again for the opportunity to testify. I will be happy to answer any questions the members may have.



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What makes Lujan run?

Pity the poor secretary of the interior, Manuel Lujan. To hear him tell it, he sits there in his big new office, full of good intentions, but he's never allowed to do the right thing, even when he knows that what he's doing instead is wrong.

It doesn't seem to matter whether he's giving away huge mining tracts on the public lands for pennies on the dollars that they're worth, or signing over oceans of cheap irrigation water for the next 40 years without so much as a nod to federal environmental laws. Every time, some mysterious force reaches down to compel Lujan to give away the resources in his care. Instead of resisting, he usually winds up blaming Congress for not writing better laws that would stop him from doing all these terrible things.

It happened again just the other day. Lujan signed a trust agreement that'll enable the J.G. Boswell Co., one of the richest agricultural corporations in the country, to collect upward of $68 million in taxpayer-paid water and crop subsidies and other public benefits over the next 10 years. Even Boswell's colleagues in agribusiness expressed reservations, fearing that Boswell's proposal strayed so far beyond propriety that it might inspire Congress to crack down generally on the large benefits they now receive under federal reclamation law.

Lujan agrees. He says flatly that he's "uncomfortable" with Boswell's proposal and thinks it violates the intent of Congress. He said all that in his press release, right after he approved the agreement.

There's nothing in the law that requires Lujan to sign Boswell's scheme — Cabinet secretaries are supposed to exercise their discretion — and in this case, he certainly didn't lack good reasons to say no. As Lujan's own legal counsel pointed out, the trust plan that Boswell adopted without even waiting for Lujan's approval directly contradicted the law. Boswell then tried to fix it after the fact without actually changing a comma in the original agreement.

But the device they came up with to try to do that has no standing or precedent in federal reclamation law and may not even be defensible under California law. Even if Boswell's quick fix could withstand a court challenge, Lujan's legal counsel points out in a formal opinion that there's no means of enforcement or anything else backing it up other than Boswell's promise to abide by it.

While the validity of Boswell's plan is a subject as open to speculation as the identity of the mysterious forces guiding Lujan's hand, one thing is certain: Congress didn't make Lujan do it. Congress in fact has been increasingly critical of the Interior Department's frequent, flagrant failure to carry out the reclamation reforms that were enacted in 1982. Congress, however, can put a stop to this nonsense by initiating the kind of thorough statutory overhaul that Boswell's fellow agriculturists warned might happen if this agreement went through.

Even Lujan says that's what's needed. But then, he always does. In the meantime, he's issued yet another dubious approval, stained with the secretary's official tears of regret and frustration. Boswell will dry it out and take it to the bank.

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The Good and the Bad of It

Under orders from Secretary of the Interior Manuel Lujan Jr., the U.S. Bureau of Reclamation at last has cooled its zeal for selling off the last big batch of unallocated water in California. The bureau's Central Valley Project has been trying to market an estimated 1 million to 1.5 million acre-feet of water annually, which is more than Southern California currently receives from the CVP's California counterpart, the state Water Project.

Lujan and the bureau finally yielded to criticism that federal officials had not adequately assessed the environmental impact of the marketing plan. This is good. But they still hope to revise their environmental impact statements and proceed with the sale by year's end. This is not so good.

In fact, the sale should be postponed at least until the state Water Resources Control Board adopts revised water quality standards for the Sacramento-San Joaquin Delta and, in effect, establishes new criteria for both the state and federal projects to pump water from the delta for use in the San Joaquin Valley and Southern California. That process will take another two or three years.

The delay will not cause the Bureau of Reclamation or its customers any harm. In cases where the bureau has been selling the water on a year-to-year basis, it could continue to do so. But it should not act now to commit such a massive amount of water in contracts running for decades, such as it did when it began renewing 40-year water contracts with farmers on the east side of the San Joaquin Valley without conducting a formal environmental review.

The bureau cannot correct the environmental damage of 40 years with 1 million acre-feet of water, but it should not compound matters by selling off these valuable supplies before California has completed its assessment of water supplies and demands, including flows needed to protect the environment. The Bush Administration has talked a lot about the primacy of state water rights, and even made a campaign issue of it. Here is a chance to back up the talk with commitment.

Folsom's flows may hit salmon

Fluctuations in fall could peril spawning

By Jim Mayer
Bee Staff Writer

Folsom Lake will be further drained this fall, officials said Tuesday, increasing the odds that chinook salmon on the lower American River will spawn in vain for a third straight year.

The U.S. Bureau of Reclamation will double its releases from the dam in October, as a part of an elaborate drought-year operation that has made full deliveries to farm customers while trying to aid salmon — including endangered winter-run chinook — on the Sacramento River.

The fluctuations — sometimes as often as hourly — between dams on the Sacramento and its tributaries have brought much of the hardship of three dry years onto Folsom.

As a result, the river will fluctuate significantly during the fall, when releases are typically consistent.

The additional releases also heighten concern that the river will not be cool enough soon enough for salmon to spawn in riffles below Nimbus Dam and for operations to begin at the state's Nimbus fish hatchery.

"Disasterville," was the forecast offered for American River salmon by Dick Daniel, assistant environmental chief for the state Department of Fish and Game.

"We are jacking the flows around and the temperatures are going to be high," Daniel said. "We are betting that will hold off the spawning activity. But we just don't know."

See FOLSOM, page B2

Folsom

Continued from page B1

From 1,500 cubic feet per second in early October, dam releases are set to gradually increase to 4,500 cfs by late October. By Nov. 8, the plan is for releases to drop to 1,850 cfs.

A more typical flow regime would put the river at 1,500 cfs from mid-September through the autumn.

Don Paff, operations chief of the Central Valley Project, said he did not know what effect the additional releases will have on the ultimate level of Folsom before it begins filling with winter runoff.

The past two years, flows were lower and warmer, giving salmon returning from three years in the sea little chance of leaving a vibrant nest of eggs behind when they spawn and die.

Biologists have seen some of the salmon on the American hold off spawning until the river temperature decreases — usually timed with the first drenching storm or a cold snap.

In past years, the peak of the spawning activity on the American has been in middle November, Daniel said.

But biologists can't predict when river temperatures will drop and the spawning begins in earnest. And Daniel said eggs laid earlier than mid-November this year could be left stranded in drying gravels when the flows are dropped.

"If we are right, we are in good shape," he said. "If the critical time for spawning is earlier than that, we are in trouble."

Increasingly over the last three years, federal and state water officials have worked with wildlife agencies to time dam releases and plan Delta pumping schedules to reduce the drought stress on species such as salmon. The fish require temperatures in the mid-50s and relatively stable flows to spawn.

Earlier this year, the bureau drastically increased releases from Folsom Dam to meet downstream commitments that in other years would have been met by much larger dams such as Shasta.

Releases from Shasta, however, are nursing the endangered winter-run chinook, a once vibrant species that counted in the thousands in recent years. But in the last count only 547 chinook returned from the Pacific.

The rapidly dropping Folsom caught boaters by surprise because the lake was nearly filled this spring for the first time in three years.

While the releases cut short the season for boaters moored at Brown's Ravine, park officials held a press conference Tuesday to show that many of the lake's ramps still reach the water.

Other water and wildlife officials outlined efforts to maintain cool temperatures in the upper Sacramento for incubating eggs of the winter-run chinook and the larger fall-run that is now migrating into Sacramento Valley rivers.

To that end, the bureau earlier in the year had put off moving water from dams north of the Delta to San Luis Reservoir near Los Banos for use next spring. The bureau will make up that Delta pumping in October, and will have to release water from Folsom to do so.

Some of the water moving through the Delta this fall will be part of a Fish and Game plan to flood wetlands near Los Banos for migrating waterfowl. That water will then be released in the spring to help push young salmon migrating through the Delta out to sea.

ramento Bee
* * Wednesday, August 23, 1989
TRO
▶ EDITORIALS

Senate Bill No. 2261

CHAPTER 1545

An act to add Chapter 8 (commencing with Section 6900) to Part 1 of Division 6 of the Fish and Game Code, relating to fish, making an appropriation therefor, and declaring the urgency thereof, to take effect immediately.

[Approved by Governor September 29, 1988. Filed with
Secretary of State September 30, 1988.]

LEGISLATIVE COUNSEL'S DIGEST

SB 2261, Keene. Salmon, Steelhead Trout, and Anadromous Fisheries Program Act.

Existing law requires commercial fishermen who take salmon to obtain a commercial fishing salmon stamp for a specified fee. The revenue from the stamps is deposited in the Commercial Salmon Stamp Account in the Fish and Game Preservation Fund and is continuously appropriated for new or expanded salmon restoration and enhancement programs on a matching fund basis, as specified.

This bill would enact the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act, under which the Department of Fish and Game, with the advice of the Advisory Committee on Salmon and Steelhead Trout and the Commercial Salmon Trollers Advisory Committee, would be required to prepare and maintain a detailed and comprehensive program for the protection and increase of salmon, steelhead trout, and anadromous fisheries of specified content and to determine the initial elements of the program within 6 months of the effective date of the bill. The bill would make legislative findings and declarations relating to the program.

The bill would require the department to determine the initial elements of the program and report thereon to the Legislature and the advisory committee within 6 months of the enactment of the bill.

The bill would appropriate $125,000 from the Environmental License Plate Fund and $166,000 from the Fish and Game Preservation Fund to the department to establish the program. The bill would also authorize the department to utilize specified federal funds for the program.

The bill would declare that it is to take effect immediately as an urgency statute.

Appropriation: yes.

The people of the State of California do enact as follows:

SECTION 1. The Legislature finds that the Advisory Committee on Salmon and Steelhead Trout, reestablished by Resolution Chapter

141 of the Statutes of 1983, has conducted a thorough inquiry into the decline of the naturally spawning salmon and steelhead trout resources of the state and has presented to the public its findings and recommendations for legislative and administrative actions to protect and increase those resources. As a result of the advisory committee's inquiry, findings, and recommendations, the Legislature has recommended the establishment of a salmon, steelhead trout, and anadromous fisheries program set forth in Chapter 8 (commencing with Section 6900) of Part 1 of Division 6 of the Fish and Game Code.

SEC. 2. Chapter 8 (commencing with Section 6900) is added to Part 1 of Division 6 of the Fish and Game Code, to read:

CHAPTER 8. SALMON, STEELHEAD TROUT, AND ANADROMOUS FISHERIES PROGRAM ACT

Article 1. Citation and Legislative Findings

6900. This chapter shall be known and may be cited as the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act.

6901. The Legislature, for purposes of this chapter, finds as follows:

(a) According to the department, the natural production of salmon and steelhead trout in California has declined to approximately 1,000,000 adult chinook or king salmon, 100,000 coho or silver salmon, and 150,000 steelhead trout.

(b) The naturally spawning salmon and steelhead trout resources of the state have declined dramatically within the past four decades, primarily as a result of lost stream habitat on many streams in the state.

(c) Much of the loss of salmon and steelhead trout and anadromous fish in the state has occurred in the central valley.

(d) Protection of, and an increase in, the naturally spawning salmon and steelhead trout resources of the state would provide a valuable public resource to the residents, a large statewide economic benefit, and would, in addition, provide employment opportunities not otherwise available to the citizens of this state, particularly in rural areas of present underemployment.

(e) Proper salmon and steelhead trout resource management requires maintaining adequate levels of natural, as compared to hatchery, spawning and rearing.

(f) Reliance upon hatchery production of salmon and steelhead trout in California is at or near the maximum percentage that it should occupy in the mix of natural and artificial hatchery production in the state. Hatchery production may be an appropriate means of protecting and increasing salmon and steelhead in specific situations; however, when both are feasible alternatives, preference shall be given to natural production.

(g) The protection of, and increase in, the naturally spawning salmon and steelhead trout of the state must be accomplished primarily through the improvement of stream habitat.

(h) Funds provided by the Legislature since 1978 to further the protection and increase of the fisheries of the state have been administered by the Department of Fish and Game in a successful program of contracts with local government and nonprofit agencies and private groups in ways that have attracted substantial citizen effort.

(i) The department's contract program has demonstrated that California has a large and enthusiastic corps of citizens that are eager to further the restoration of the stream and fishery resources of this state and that are willing to provide significant amounts of time and labor to that purpose.

(j) There is need for a comprehensive salmon, steelhead trout, and anadromous fisheries plan, program, and state government organization to guide the state's efforts to protect and increase the naturally spawning salmon, steelhead trout, and anadromous fishery resources of the state.

6902. The Legislature, for purposes of this chapter, declares as follows:

(a) It is the policy of the state to significantly increase the natural production of salmon and steelhead trout by the end of this century. The department shall develop a plan and a program that strives to double the current natural production of salmon and steelhead trout resources.

(b) It is the policy of the state to recognize and encourage the participation of the public in privately and publicly funded mitigation, restoration, and enhancement programs in order to protect and increase naturally spawning salmon and steelhead trout resources.

(c) It is the policy of the state that existing natural salmon and steelhead trout habitat shall not be diminished further without offsetting the impacts of the lost habitat.

Article 2. Definitions

6910. Unless the context clearly requires a different meaning, the definitions in this article govern the construction of this chapter.

6911. "Production" means the survival of fish to adulthood as measured by the abundance of the recreational and commercial catch together with the return of fish to the state's spawning streams.

6912. "Program" means the program for protecting and increasing the naturally spawning salmon and steelhead trout of the state provided for in Article 3 (commencing with Section 6920).

Article 3. Salmon, Steelhead Trout, and Anadromous Fisheries Program

6920. (a) The department shall, with the advice of the Advisory Committee on Salmon and Steelhead Trout and the Commercial Salmon Trollers Advisory Committee, prepare and maintain a detailed and comprehensive program for the protection and increase of salmon, steelhead trout, and anadromous fisheries.

(b) The department shall consult with every public agency whose policies or decisions may affect the goals of this program to determine if there are feasible means for those public agencies to help the department achieve the goals of this program.

6921. The program shall identify the measures the department will carry out to achieve the policies set forth in Section 6902.

6922. The program shall include, but is not limited to, all of the following elements:

(a) Identification of streams where the natural production of salmon and steelhead trout can be increased primarily through the improvement of stream and streambank conditions without effect on land ownership, land use practices, or changes in streamflow operations.

(b) Identification of streams where the natural production of salmon and steelhead trout can be increased only through the improvement of land use practices or changes in streamflow operations.

(c) Identification of streams where the protection of, and increase in, salmon and steelhead trout resources require, as a result of significant prior loss of stream habitat, the construction of artificial propagation facilities.

(d) A program element for evaluating the effectiveness of the program.

(e) Recommendations for an organizational structure, staffing, budgeting, long-term sources of funding, changes in state statutes and regulations and federal and local government policy and such other administrative and legislative actions as the department finds to be necessary to accomplish the purposes of this chapter.

(f) Identification of measures to protect and increase the production of other anadromous fisheries consistent with policies set forth in Section 6902.

(g) Identification of alternatives to, or mitigation of, manmade factors which cause the loss of juvenile and adult fish in California's stream system.

6923. Measures which are the responsibility of other agencies or persons, such as the repair or replacement of dysfunctional fish screens, are not eligible for funding under the program.

6924. The department shall determine the initial elements of the program and transmit a report describing those elements to the Legislature and the Advisory Committee on Salmon and Steelhead

Trout within six months of the effective date of this chapter.

SEC. 3. The Department of Fish and Game shall determine the initial elements of the salmon, steelhead trout, and anadromous fisheries program initiated pursuant to Chapter 8 (commencing with Section 6900) of Part 1 of Division 6 of the Fish and Game Code, shall coordinate existing programs, and shall implement the elements of the program. In addition to the personnel positions authorized in the Budget Act of 1988, the department shall use moneys allocated to the salmon, steelhead trout, and anadromous fisheries program, upon appropriation by the Legislature, to provide three additional personnel years for the purposes of maintaining a salmon, steelhead trout, and anadromous fisheries program. The department shall annually submit a budget for the purpose of continuing this program.

SEC. 4. The sum of one hundred twenty-five thousand dollars ($125,000) is hereby appropriated from the Environmental License Plate Fund, and the sum of one hundred sixty-six thousand dollars ($166,000) is hereby appropriated from the Fish and Game Preservation Fund to the Department of Fish and Game to establish the salmon, steelhead trout, and anadromous fisheries program pursuant to Chapter 8 (commencing with Section 6900) of Part 1 of Division 6 of the Fish and Game Code. The department may also utilize its allocation of funds received pursuant to Chapter 10B (commencing with Section 777) of Title 16 of the United States Code for this program.

SEC. 5. This act is an urgency statute necessary for the immediate preservation of the public peace, health, or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts constituting the necessity are:

The decline of naturally spawning salmon, steelhead trout, and other anadromous fish resources is occurring at such a rate that some segments of these native California fish may be threatened with extinction. In order to stop the decline and restore the fishery resource at the earliest possible time, it is necessary that this act take effect immediately.

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Senator **Bradley**. Now we'll hear from Mr. Daniel Chapin, vice president, California Waterfowl Association.

STATEMENT OF DANIEL CHAPIN, VICE PRESIDENT, CALIFORNIA WATERFOWL ASSOCIATION

Mr. **Chapin**. Mr. Chairman, Congressman Fazio, my name is Daniel Chapin, and I am representing the California Waterfowl Association. We welcome the Subcommittee's interest in the Central Valley natural resource problems associated with the construction and operation of the Central Valley Project. We also appreciate the opportunity of presenting our comments on the waterfowl habitat issue.

And these comments will be focused specifically upon that issue.

The waterfowl carrying capability of the Central Valley is critically important to the preservation of continental waterfowl populations and the survival of the Pacific Flyway. During the period 1970 to 1989, the Valley wintered almost 25 percent of the continental waterfowl population. For pintail ducks, the figure was over 50 percent.

Over 60 percent of the Pacific Flyway's waterfowl winter in the Valley and a significant additional percentage of both the continental and flyway populations use it as a staging area during their fall and spring migrations. Because of the importance of this habitat, the North American Waterfowl Management Plan has designated it as one of the six highest priority waterfowl areas in the lower 48 States.

Historically, California had about five million acres of wetlands, of which four million were in the Central Valley Project's service area. Today there are about 290,000 left in the Valley. That's a drop of about 93 percent, of which 80,000 acres are in State and Federal waterfowl areas and the 210,000 acre balance is in private sector waterfowl habitat. The attached U.S. Fish and Wildlife Service graph charts these enormous losses on a statewide basis. It's in the submitted testimony, I'm not going to take the time.

A reasonable extrapolation of those losses is that about 100,000 acres has been lost in the Central Valley since 1944, due to the construction, and specifically the operation of the Central Valley Project. This does not include any wetlands converted to agriculture prior to 1944, which originally depended upon pumped ground water, but now use CVP surface water supplies.

In March 1989, the U.S. Bureau of Reclamation published the results of four years and $400,000 worth of investigation into the Central Valley Refuge water supply needs. This report describes the water supply problems of each State and Federal waterfowl refuge in the Valley, plus those of the Grasslands Resource Conservation District, analyzes each area's water needs at four different management levels, evaluates the incremental wildlife benefits associated with each management level, identifies potential water supply sources, and discusses alternative ways of getting water from where it is to where it is needed. The water need and wildlife benefit figures were developed the U.S. Fish and Wildlife Service, and the California Department of Fish and Game.

Some people will ask why the Grasslands Resource Conservation District is included, because it is primarily privately owned wetlands. The GRCD is a 60,000 acre complex of private sector waterfowl habitat in the northern part of the San Joaquin Valley. It is contiguous with the Kesterson National Wildlife Refuge and the State's Los Banos Wildlife Area, and is adjacent to the San Luis National Wildlife Refuge and the State's Volta Wildlife Area.

Historically, it has depended upon agricultural drainage waters for 60 percent of its water supply. As occurred at Kesterson NWR, this drainage water has become contaminated with selenium, and its use was discontinued in 1985. It is critically important that a replacement supply be provided to avoid the loss of this major habitat complex.

What I have done is enclose a table based upon the information on refuge water needs contained in the Central Valley Refuge Water Supply Investigation.

This table breaks out the water requirement in acre feet required to attain four different management levels on the refuges. The first is the existing firm supply, a level one supply. This is firm, long-term water, either under Bureau contract or riparian rights, or other definitely recognized supplies.

Level two is the amount of water currently being used by refuges. This is the level at which they're operating today. It is important to recognize that the level two supply is simply the water the present refuges are presently receiving, i.e., if any quantity less than level two is provided, refuges are in effect being dewatered.

That water differential between level one and level two is provided by CVP water on a when and if available basis. And that's not a very strong, a very firm foundation. There is general agreement—

Senator BRADLEY. Level three?

Mr. CHAPIN. I beg your pardon?

Senator BRADLEY. What is level three?

Mr. CHAPIN. Level three was an analysis of what water could, if you operated the refuges full bore, full involvement, this is the water which would be required in order to provide optimum habitat management. If, at level four, the increment between level three and level four is, what would happen if you improved the refuges and the water supply delivery systems to the optimum, what's the maximum that they could really effectively use.

There is general agreement that level four is the most cost effective way of maximizing refuge waterfowl benefits, because it generates them through more intensive management of existing wildlife areas and without additional land or personnel costs, or not too much more personnel costs. However, it does involve significant additional water supplies and delivery facilities which require the preparation of a final planning report, together with the necessary environmental documentation.

Regardless of the Refuge Water Supply Program selected, the USBR is expected to be the program administrator for two reasons.

One, this program is an appropriate mission for the Bureau of Reclamation acting in its new role as a natural resources manager. Two, the Bureau is the only entity in this region of California that has the facilities, the expertise, and the capability to deliver in excess of 500,000 acre feet of water to fourteen different locations operated by three different entities and spread up and down 400 miles through the Central Valley. So whether you like the Bureau or not, they're where it's at.

We would like to propose some legislation. In 1986, the Congress enacted Public Law 99–546. Section 104 of this legislation reserves 25 percent of the uncontracted yield of the CVP until Congress addresses the refuge water supply needs. With the completion of the investigation, the introduction of such enabling legislation is now reasonable and appropriate.

The proposed legislation should deal with the following subjects. The USBR should be reauthorized to provide CVP water and power for fish and wildlife purposes, and these purposes should receive the same priority as agricultural uses.

Two, the USBR should be authorized and directed to promptly enter into contracts with the Service, California Fish and Game, and the Grasslands Water District to provide firm CVP water supplies to the waterfowl areas identified in the investigation report. The quantity and delivery schedule for each Central Valley area should be in accordance with level two of the investigation report's dependable water supply needs table for that area. The quality of the water should be suitable for use on waterfowl habitat.

Three, the Bureau should be authorized and directed to complete, in conjunction with its water contracting studies, and final planning report describing the preferred alternative for increasing water supplies to the Central Valley waterfowl areas from level two to level four as defined in the investigation report.

Four, pending completion of the final planning report, the Bureau should be authorized and directed to enter into agreements with the Service, California Fish and Game and the Grasslands Water District to provide level four supplies on an interim basis.

You'll note that this discussion deals only with the refuges. There are 210,000 acres of other wetlands out there. Their needs are not as well defined at the present time, so I'm not going to take them on.

We have also suggested some things that the Bureau could do which would involve it more fully in the process. That the Bureau embrace the idea that fish, wildlife and other natural resource groups are part of its constituency. That the Bureau seek the same type of active partnership with its new constituents that it has had for years with its traditional ones.

That the Bureau recognize that in a true partnership, all partners provide input to the nature and direction of the activity. That the Bureau take the lead in obtaining the authority which it feels it lacks to do such things as use CVP water and power for fish and wildlife purposes, buy water, provide CVP power to move non-project water, etcetera. That the Bureau take the lead in establishing multi-constituent work teams to address major resource issues and allocations.

Thank you very much.

Senator **Bradley**. Thank you very much, Mr. Chapin.

[The prepared statement of Mr. Chapin follows:]

August 21, 1989

THE FEDERAL ROLE IN ADDRESSING MAJOR WATERFOWL HABITAT PROBLEMS IN THE CENTRAL VALLEY OF CALIFORNIA[1]

Mr. Chairman and Members of the Committee,

My name is Daniel Chapin, and I am representing the California Waterfowl Association. We welcome the subcommittee's interest in the Central Valley natural resource problems associated with the construction and operation of the Central Valley Project. We also appreciate the opportunity of presenting our comments on the waterfowl habitat issue.

The waterfowl carrying capability of the Central Valley is critically important to the preservation of continental waterfowl populations and the survival of the Pacific Flyway. During the period 1970-1979, the Valley wintered almost 25 percent of the continental waterfowl population. For pintail ducks, the figure was over 50 percent. Over 60 percent of the Pacific Flyway's waterfowl winter in the Valley and a significant additional percentage of both the continental and flyway populations use it as a staging area during their fall and spring migrations. Because of the importance of this habitat, the North American Waterfowl Management Plan has designated it as one of the six highest priority waterfowl areas in the lower forty-eight states.

Background - historically, California had about 5 million acres of wetlands of which 4 million were in the Central Valley

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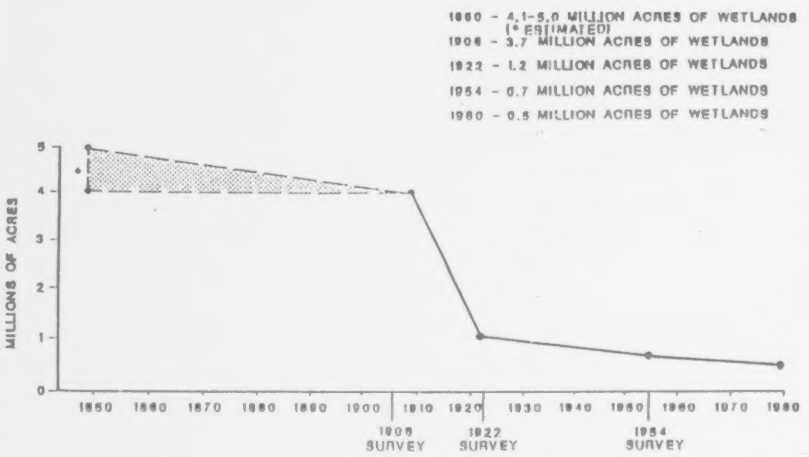
[1] Comments of the California Waterfowl Association presented at the August 29, 1989 oversight hearing of the U.S. Senate Subcommittee on Water and Power.

Project (CVP) service area. Today there are about 290,000 acres left in the Valley of which 80,000 acres are in state and federal waterfowl areas and the 210,000 acre balance is in private sector waterfowl habitat. The attached U.S. Fish and Wildlife Service (USFWS) graph charts these enormous wetland losses on a statewide basis. A reasonable extrapolation is that 100,000 acres has been lost in the Central Valley since 1944 due to the construction and especially, the operation of the CVP. This does not include any wetlands converted to agriculture prior to 1944 which originally depended upon pumped ground water, but now use CVP surface water supplies.

State Wetlands Policy - in 1978, the California legislature enacted Senate Concurrent Resolution 28 establishing a wetlands policy. In brief, it calls for the preservation of existing wetlands, programs to increase wetland wildlife habitat values, and a fifty percent increase in wetland habitat acreage by the year 2000. In addition, there are numerous state statutes which contain legislative intent language regarding the protection, preservation, restoration, enhancement and creation of wetlands.

Federal Wetlands Policy - among the many examples are the waterfowl treaties between the United States and various foreign countries, the Migratory Bird Treaty Act of 1918, and recently the North American Waterfowl Management Plan agreement between Canada and the United States (which was signed in 1986 by the Secretary of the Interior). It commits both countries to the restoration of continental waterfowl populations.



SOURCE: U.S. FISH AND WILDLIFE SERVICE, PORTLAND, OREGON

FIGURE II-5

HISTORICAL LOSSES OF WETLANDS IN CALIFORNIA

Central Valley Refuge Water Supply Investigation - this March 1989 USBR publication is the result of four years and $400,000 worth of work. It describes the water supply problems at each state and federal waterfowl refuge in the Valley plus those of the Grassland Resource Conservation District (GRCD), analyzes each area's water needs at four different management levels, evaluates the incremental wildlife benefits associated with each management level, identifies potential water supply sources, and discusses alternative ways of getting water from where it is to where it is needed. The water need and wildlife benefit figures were developed by the USFWS, and the California Department of Fish and Game (CDFG).

The GRCD is a 60,000 acre complex of private sector waterfowl habitat in the northern part of the San Joaquin Valley. It is contiguous with the Kesterson NWR and the state's Los Banos WA and is adjacent to the San Luis NWR and the state's Volta WA. Historically, it has depended upon agricultural drainage waters for 60 percent of its water supply. As occurred at Kesterson NWR, this drainage water has become contaminated with selenium, and its use was discontinued in 1985. It is critically important that a replacement supply be provided to avoid the loss of this major habitat complex.

Enclosed is a Dependable Water Supply Needs table adapted from the Investigation report which breaks out the water requirement (in acre feet) to attain each management level. It is important to recognize that the Level 2 supply is simply the

May 10, 1989

TABLE I
DEPENDABLE WATER SUPPLY NEEDS
ALTERNATIVE SUPPLY LEVELS

Refuge	Acres	Level 1 Supply (a/f)	Level 2 Supply (a/f)	Level 3 Supply (a/f)	Level 4 Supply (a/f)	"A" Supply (a/f)	"B" Supply (a/f)	"C" Supply (a/f)
SACRAMENTO VALLEY								
Sacramento NWR	10,776	0	46,400	50,000	50,000	46,400	3,600	50,000
Delevan NWR	5,583	0	20,950	25,000	30,000	20,950	9,050	30,000
Colusa NWR	4,042	0	25,000	25,000	25,000	25,000	0	25,000
Sutter NWR	2,394	0	23,500	30,000	30,000	23,500	6,500	30,000
Gray Lodge WMA	8,400	8,000	35,400	41,000	44,000	27,400	8,600	36,000
Subtotal	31,195	8,000	151,250	171,000	179,000	143,250	27,750	171,000
SAN JOAQUIN VALLEY								
Grasslands RCD(a)	52,000	50,000	125,000	180,000	180,000	75,000	55,000	130,000
Volta WMA	3,000	10,000	10,000	13,000	16,000	0	6,000	6,000
Los Banos WMA	3,208	6,200	16,670	22,500	25,000	10,470	8,330	18,800
Kesterson NWR	4,620	3,500	3,500	10,000	10,000	0	6,500	6,500
San Luis NWR	7,430	0	13,350	19,000	19,000	13,350	5,650	19,000
Merced NWR	2,562	0	13,500	16,000	16,000	13,500	2,500	16,000
Mendota WMA	10,740	25,463(b)	18,500	24,000	29,650	0	0	4,187(c)
Pixley NWR	4,350	0	1,280	3,000	6,000	1,280	4,720	6,000
Kern NWR	10,628	0	9,950	15,050	25,000	9,950	15,050	25,000
Subtotal	98,538	95,163	211,750	302,550	326,650	123,550	103,750	231,487
TOTAL	129,733	103,163	363,000	473,550	505,650	266,800	131,500	402,487

Notes:

Level 1 Supply	Existing firm water supply
Level 2 Supply	Current average annual water deliveries
Level 3 Supply	Full use of existing development
Level 4 Supply	Full Development
"A" Supply =	Level 2 Supply minus Level 1 Supply = existing "when and if available" water supplies which need to be firmed up.
"B" Supply =	Level 4 Supply minus Level 2 Supply = additional new water supplies required to maximize wildlife benefits.
"C" Supply =	"A" Supply plus "B" Supply.

(a) As of 1985, Grassland Resource Conservation District no longer receives agricultural drainage flows due to water quality concerns.

(b) Only 18,500 a/f can be delivered without modifications of existing facilities.

(c) Since Level 1 is higher than Level 2, the actual additional needed firm water supply is Level 4 - Level 1 rather than "A" and "B".

water that the refuges are presently receiving; i.e., if any quantity less than Level 2 is provided, the refuges are in effect being dewatered. Since Level 2 is the current supply level, providing this water entails no increase in Delta exports or additional need for conveyance capacity (except for the 75,000 acre feet of replacement water for the GRCD).

There is general agreement that Level 4 is the most cost effective way of maximizing refuge waterfowl benefits because it generates them through more intensive management of existing wildlife areas and without additional land or personnel costs. However, it does involve significant additional water supplies and delivery facilities which require the preparation of a Final Planning Report together with the necessary environmental documentation.

Current Status - Regardless of the Refuge Water Supply Program selected, the USBR is expected to be the program administrator for two reasons:

1. This program is an appropriate mission for the Bureau of Reclamation acting in its new role as a natural resources manager.
2. The USBR is the only entity in this region of California that has the facilities, expertise, and capability to deliver in excess of 500,000 acre feet of water to fourteen locations operated by three different entities and spread 400 miles up and down the Central Valley.

Proposed Legislation

In 1986, the Congress enacted Public Law 99-546. Section 104 of this legislation reserves 25 percent of the uncontracted yield of the CVP until Congress addresses the refuge water supply needs. With the completion of the Investigation, the introduction of such enabling legislation is now feasible and appropriate.

The proposed legislation should deal with the following subjects:

1. The USBR should be authorized to provide CVP water and power for fish and wildlife purposes.
2. The USBR should be authorized and directed to promptly enter into contracts with the USFWS, the CDFG, and the Grassland Water District to provide firm CVP water supplies to the waterfowl areas identified in the Investigation report. The quantity and delivery schedule for each Central Valley area should be in accordance with Level 2 of the Investigation report's Dependable Water Supply Needs table for that area. The quality of the water should be suitable for use on waterfowl habitat.
3. The USBR should be authorized and directed to complete, in conjunction with the USBR's Water Contracting Studies, a Final Planning Report describing the

preferred alternative for increasing water supplies to the Central Valley waterfowl areas from Level 2 to Level 4 as defined in the Investigation report.

4. Pending completion of the Final Planning Report, the USBR should be authorized and directed to enter into agreements with the USFWS, the CDFG and the Grassland Water District to provide Level 4 supplies of CVP water to the Central Valley waterfowl areas on an interim basis providing that the necessary water conveyance facilities and systems are presently available.

Results

Enactment of this legislation would create a solid water supply foundation to support the Central Valley refuge system using water presently allocated for this purpose and without incurring significantly increased costs. At the same time, it would create a level playing field on which to base the USBR's Water Contracting Studies.

The Final Planning Report covering the additional water supplies needed to achieve Level 4 habitat management is expected to evaluate such "new" water sources as offstream storage in wetlands, conjunctive ground water use programs, modification of water system operations to achieve multiple benefits using the same water, water marketing, water conservation, and the wide variety of other new management actions which have recently been identified to increase the efficiency with which California uses its water resources.

The Subcommittee has raised three questions concerning the future activities of the Bureau and its relationship with its constituents. In response, the Association makes the following suggestions:

1. That the Bureau embrace the idea that fish, wildlife and other natural resource groups are part of its constituency.
2. That the Bureau seek the same type of active partnership with its new constituents that it has had for years with its traditional ones.
3. That the Bureau recognize that in a true partnership, all partners provide input to the nature and direction of the activity - not just in an advisory capacity, but as part of the decision making process.
4. That the Bureau take the lead in obtaining the authority which it feels it needs to do such things as use CVP water and power for fish and wildlife purposes, buy water, provide CVP power to move non-project water, etc.
5. That the Bureau take the lead in establishing multi-constituent work teams to address major resource use and allocation issues. The Delta Fishery Agreement recently negotiated between the California Department of Water Resources, the State Water Project contractors, and the Delta fishery interests is a good recent example of this approach.

We appreciate the opportunity of providing this input and hope that it will be helpful to you. If there are any questions, I would be happy to answer them.

Senator **Bradley**. Mr. Candee, you advocate that the price for water should be more related to market prices, with less subsidy. What is your judgment, and what evidence do you have, about the price elasticity of agricultural water demand? If price goes up, will demand drop, or is it inelastic?

Mr. **Candee**. Well, Mr. Chairman, I'm very pleased to say that we have a new national expert on this topic. Secretary Lujan announced, when he decided to sign the new 40 year contract with the Orange Cove Irrigation District, I think his quote was, "We're going to raise the price by four times the amount, and that's going to do more for conservation than all the environmental lawsuits combined." And I think he's right, that there is a big connection between raising the price of water and increasing conservation.

In fact, the Commissioner of the Bureau, Commissioner Duvall, has been giving speeches recently about the connection between increasing pumping costs of groundwater and the incentive to conserve. So I think they're both correct, I think the studies show that there is an elastic relationship, that there is a link between increasing price and water conservation, particularly when the prices are so far below the cost.

Senator **Bradley**. But my interest is really not the restatement of the theory, but whether there is evidence, hard evidence of work done on agricultural urban water demand.

Mr. **Candee**. Yes, there is. In fact, there are some studies that I'd be happy to supply to the Subcommittee. The Bureau has contracted in the last five or ten years with some independent consultants who came up with definite evidence that as the price went up above a certain level, demand slacked off.

Also the state Department of Water Resources reported recently that some of these irrigation districts in the San Joaquin Valley that have done their own tiered pricing are finding that demand has in fact gone down.

Senator **Bradley**. If you would supply those studies, the Committee would gladly accept them. Now, do you know, is there anything in reclamation law or in the CVP authorization that would preclude the Secretary of Interior from making a direct allocation of water for instream use?

Mr. **Candee**. No, I'm not aware of anything.

Senator **Bradley**. Either in the Reclamation Act or in the CVP authorization.

Mr. **Candee**. No.

Senator **Bradley**. That would preclude him from diverting, essentially, water into instream use.

Mr. **Candee**. The idea that the Secretary is allowed to leave some water in a river, he doesn't have to divert all of it out of the river, I think, is a pretty sensible one, and one that has no legal impediments.

The issue, of course, is being raised right now in the context of the Friant contract renewals. And our position is that the Secretary does have discretion, he doesn't have to automatically give away 100 percent of the river, that he has some discretion. And of course, we've been joined in that view by the Environmental Protection Agency, by some internal staff at Fish and Wildlife Services.

Senator **Bradley**. Right. But your view is that he has discretion, so there's obviously nothing in the law that precludes him from doing that.

Mr. **Candee**. Exactly.

Senator **Bradley**. Mr. Krautkraemer, what would you like to see the Bureau do to promote the resolution of the Bay-Delta water quality question?

Mr. **Krautkraemer**. Well, I think there are several things they could do. The first relates to the development and use of information necessary for the state Water Resources Control Board to establish standards for the Delta.

As I mentioned earlier, there are other Federal agencies that play a major role, both in researching and developing options for protecting fish and wildlife, including the Bay-Delta. Those include principally the U.S. Fish and Wildlife Service. Also, at least in the area of research, the U.S. Geological Survey.

Senator **Bradley**. Do you agree with Mr. Maughan, who said that in terms of information, they needed more information on the biological impact, and on contaminant transport.

Mr. **Krautkraemer**. No, in fact, I think in my direct testimony I mentioned that I disagree with Mr. Maughan on that. In fact, the U.S. Fish and Wildlife Service presented evidence related to salmon, and also supported some of the testimony presented by other agencies, including the Department of Fish and Game, which called for increased flow in the Estuary.

And this is an area where I think, within the Federal Government, within the Department of the Interior, Fish and Wildlife Service has been given the primary responsibility for addressing fish and wildlife concerns.

During the first phase of the Bay-Delta hearing, the Department of the Interior, I think should be commended for allowing Fish and Wildlife Service to appear separately through separate counsel, and to present testimony and recommendations.

And I would hope that continues throughout the hearing process. I think that's a fundamental thing that needs to be done in order to ensure that the Federal Government's role in helping the State reach resolution of these issues is accomplished.

To add to that, I think the Bureau, both in the specific context of the Bay-Delta hearings, and in the larger context, well, I welcome its renewed environmental mission. But it needs to recognize that there are Federal agencies out there whose primary responsibility is protection of the environmental resources, protection of fish and wildlife. And that the Bureau should give due deference to the primary charge to those agencies.

Senator **Bradley**. So what are you saying? Are you saying that the Bureau should take into fuller consideration the information and opinions available in other places in the Federal Government, particularly the Fish and Wildlife Service?

Mr. **Krautkraemer**. Yes.

Senator **Bradley**. That's it.

Mr. **Krautkraemer**. I think all too often, within the Department of the Interior, the Bureau of Reclamation exercises somewhat more persuasive role than Fish and Wildlife Service might do.

Senator **BRADLEY**. Okay. If someone asked you bluntly and you were on a television program and you had 30 seconds to answer, what is the Federal interest in Delta water quality?

Mr. **KRAUTKRAEMER**. I've already alluded to some of the national interest in protection of the Bay-Delta Estuary. This is an estuary which is home to migratory waterfowl, home of the Pacific Flyway, it's important for migratory fish, such as salmon, which Mr. Bingham's testimony addressed. There's a large economic value associated with the Bay water quality, and Congress recognized this in the 1987 amendments to the Clean Water Act, when it designated San Francisco Bay as one of the first estuaries which is part of the National Estuary Program.

So I think there's a strong national interest in protecting the Bay-Delta Estuary.

Senator **BRADLEY**. I took it from your testimony, and I know from my own experience with EDF, that you really have been a leader in promoting water marketing, including the creation of financial incentives, as a way for users to conserve.

Do you think that this approach might encourage people who have access to water now, who are existing users, to get ahold of all the water they can, and hold it, so that they'll be ready to use it when the time for expanded marketing comes?

Mr. **KRAUTKRAEMER**. Well, under the current situation, I think that's a possibility. I don't think it's real likely, because I think that would take execution of new contracts by the Bureau of Reclamation, which I don't think should take place.

I would say that there are sort of different tiers of water marketing, and what EDF has focused on is using water marketing and water transfers as a method of encouraging users to conserve or reduce their water that's already in use. The classic example would be Imperial Irrigation District, Metropolitan Water District transfer, where Met is essentially paying IID to include its irrigation system, and you're creating a new water supply.

There are other options, for example, on the west side of the Valley, where water transfers might even be used as a positive incentive to both improve irrigation systems and just to reduce water use. It depends on how you define conservation. That might include voluntary decisions not to farm certain lands, and to market that water out elsewhere.

There's another tier of water marketing which was evidenced by a recent effort of the Yuba Water District to transfer water, which is transferring water which is sitting behind a dam and not being used. And that's not the kind of transfers that we're trying to encourage. And we see that essentially, in this case in particular, essentially was a situation where the Department of Water Resources was hooking into Yuba's water supply as an adjunct to the State Water Project.

Senator **BRADLEY**. Were you suggesting in your testimony that the Congress use the 10(h) approval process as a way to deal with other issues relating to conservation, or other kinds of issues?

Mr. **KRAUTKRAEMER**. No, I don't think that Congress has to go that far. I think the choice Congress has—it could, but I think the choice Congress has to make basically is whether or not to approve these contracts. And what I was recommending was that Congress not approve the contracts until the Bureau of Reclamation has mitigated the environmental degradation that it's caused in the Bay-Delta Estuary and in other environments that would be affected by the contracts.

Senator **Bradley**. But I take it, Mr. Chapin, you would like the Congress to use the 25 percent of the CVP water reserved in order to assure that remedial steps would be taken on the Estuary? What was your point there? I didn't, as you can tell, quite get it.

Mr. **Chapin**. This fortuitously, and believe me, that's the right choice of words, that 250,000 or 275,000 acre feet, depending on how you calculate it, happens to be about what it takes to firm up the refuge water supply at level two, to just shift what's already going to the refuges onto a firm basis.

And we believe that that's something—now, that water is already going to these areas. So making sure that it continues to go to these areas would not be taking any water away from the San Francisco Bay or the Delta that isn't already going.

Senator **Bradley**. But you're saying, instead of making it an annual negotiation, lock it in?

Mr. **Chapin**. Well, hoped-for negotiations. There's no assurance that that water is permanently available.

Senator **Bradley**. OK, and then, Mr. Bingham, can you tell me, we've had a lot of talk about the temperature control device at Shasta. And, you know, one idea was inexpensive, and it proved unworkable. Another idea, rather expensive. How important is it really?

Mr. **Bingham**. It's extremely important. Because right now, it's apparent that the temperature regimes in the Upper Sacramento are having a direct and very severe impact on both the winter and the spring run, and also on the fall run. I mean, if the water is hot in the fall, when the fall run comes up to spawn, you have mortality, you have spawners which we've been regulated to put in the river, dying before they can successfully spawn.

So the temperature regime in the Upper Sacramento River is absolutely vital to the health of the Sacramento River salmon resource. And our hope is that whatever they do, it's going to be something permanent that will work.

Senator **Bradley**. Congressman Fazio?

Mr. **Fazio**. Mr. Chairman, I just wanted to bring up a point Mr. Bingham and Mr. Chapin rushed to conclusion in their statements, and I think it would be important to get your view on the need to reauthorize the CVP for purposes of fish and wildlife conservation. I think you both had some comments you wanted to make that would go beyond where Mr. Bontadelli felt constrained to stop, in terms of a generic piece of legislation. Do you want to comment for the few remaining minutes we have?

Mr. **Chapin**. Yes. I believe we should shoot for something in between. Broad generic language to reauthorize it is fine, but I think that you have to—that doesn't cause the Bureau to actually do something, it just allows it to.

On the other hand, I participated in the Suisun Marsh negotiations on behalf of the Suisun Resource Conservation District, and that took eight years. So I'm not just rushing out the door to do it on a project-by-project basis, either. I think you can do something in between. You can deal with the wetland water issue, you can deal with the fish as a package. You could deal with the fishery flows as a package. There's no reason why you couldn't combine the two, except for the fact that in terms of knowledge, and a point in being developed and ready to work, to do something with. But that stuff just happens to be ahead of the fish thing.

A couple of years from now, the fish will be where we are today. So you could combine the two of them into a duck and fish package, or you could do them separately, but don't do it project by project. Do it resource by resource.

Mr. **Fazio**. Mr. Bingham?

Mr. **Bingham**. I would agree with that, and I would simply say in addition, that I think as part of a reauthorization process, it should be fundamentally established that the fishing industry as a food producer should stand on the basis of equality with the farm interests. Right now, we're the stepchildren. We're, you know, sure, the minimum flows are set first, but consideration is given last. I mean, everybody looks to get something out of us. We've been suffering for years. We want to have these basic inequities addressed in the reauthorization.

Senator **Bradley**. And Mr. Bingham, I appreciate your point about the fact that, because of the dramatic drop in the number of salmon in stream, there are now restrictions on ocean salmon fishing. When you have the combination of the two together, you have a real threat to the livelihood of salmon fishermen.

Mr. **Bingham**. That's correct. I mean, we're only seeing it starting to come down on us for this winter run now, in the Sacramento. Already, as I mentioned in my direct testimony.

Senator **Bradley**. Right.

Mr. **Bingham**. We've gone down from 250,000 fish to 30,000 fish on the North Coast.

Senator **Bradley**. Well, let me thank all four of you for your testimony this morning. I think it's been extremely helpful. We will resume the hearing this afternoon at two o'clock. Let me thank the first panel as well today, and thank Mr. Krautkraemer, Mr. Candee, Mr. Bingham, and Mr. Chapin for taking the time to enlighten us.

The Subcommittee will stand in recess until two p.m. this afternoon.

[Whereupon, at 12 noon, the subcommittee recessed for lunch.]

AFTERNOON SESSION

Senator **Bradley**. The Subcommittee will come to order. Our third panel today consists of Jean Auer, special consultant, Committee for Water Policy Consensus; Greg Thomas, president, Natural Heritage Institute, Stephen K. Hall, executive director, Land Preservation Association, Jerald Butchert, general manager of Westlands Water District.

Let me welcome you all to the Subcommittee, and urge you to share with us your views as candidly as you possibly can. I thought that this morning's panel, both panels were very informative, and I know this afternoon will be equally so. And slowly toward the end of the day, we'll be able to put everybody on one big chart, and see the places where there are agreements and disagreements, and then we'll be able to derive what we hope will be good information from the hearing.

So why don't we begin with Jean Auer. Welcome to the Subcommittee.

STATEMENT OF JEAN E. AUER, VICE CHAIR, SAN JOAQUIN VALLEY DRAINAGE PROGRAM'S CITIZENS ADVISORY COMMITTEE

Ms. AUER. Thank you. Thank you for this opportunity to comment. My name is Jean Auer, I'm vice chair of the San Joaquin Valley Drainage Program's Citizens Advisory Committee to the Program Management Committee and a consultant to the Committee for Water Policy consensus.

I'm also happy to be filling the role of protecting that endangered species of women testifying on water matters in the hearing process today.

The Citizens Advisory Committee to the San Joaquin Valley Drainage Program consists of 14 individuals of diverse backgrounds and interests, united in their conviction that environmentally and economically sound solutions must be found to the drainage problems of the San Joaquin Valley. A list of committee members is included with my written statement.

At this juncture, the Committee is looking at all possibilities from an optimistic perspective, grounded in the belief that there is reason for diverse interests to work together in addressing the Valley's vexing complex drainage problems. The Citizens Advisory Committee hopes to contribute to turning these problems into solutions.

The Valley's drainage problems are almost as old as its irrigated agriculture. As early as the 1890's, some cultivated lands were forced out of production because of salt and drainage problems. Despite a long history of drainage problems, solutions have been fragmented and remain incomplete to this day. The lack of adequate drainage has long been recognized as a serious problem for irrigated agriculture in the western and southern San Joaquin Valley. For that reason, the Federal and State projects that import irrigated water to the area included plans for a master drainage canal leading to the Sacramento-San Joaquin Delta.

By 1975, 85 miles of the Drain, 120 miles of collector drains and the first phase of the Kesterson Regulating Reservoir had been completed and were receiving subsurface drainage water from lands in the Federal service area.

By 1983, with the discovery of migratory bird deaths and deformities linked to the high selenium levels in agricultural drainage water at Kesterson, it was clear that the Valley's drainage problem involved not only agriculture, but also fish and wildlife resources, water quality and possibly public health.

In mid-1984, five State and Federal agencies formed the San Joaquin Valley Drainage Program to investigate drainage problems and identify possible solutions.

In 1987, the focus of the Drainage Program was directed to planning steps that could be taken to address agricultural drainage and related problems within the San Joaquin Valley itself. Accordingly, the concept of a master drain leading out of the Valley is not within the scope of this Program. This focus reflected a need to control conditions and manage problems as close to their source as possible, and to help ensure that areas outside the Valley would not be adversely affected by the Valley's problems or by steps taken to solve those problems.

It includes the entire Valley, but concentrates on the western half, where most of the drainage problems originate. The west side is divided into five sub-areas, Northern, Grasslands, Westlands, Tulare and Kern.

Current agricultural drainage conditions on the west side present two basic problems, salt buildup and waterlogging of irrigated lands, due to the high groundwater table, which adversely affects crops and productivity, and toxic or potentially toxic trace elements in the shallow groundwater, which when drained and discharged to streams, ponds or wetlands, can adversely affect fish and wildlife.

The severity of the toxics problem first became clear at Kesterson six years ago. Now, concentrations of drainage water contaminants and rates of deformities higher than those found at Kesterson are being found associated with evaporation ponds in the Tulare Basin, which is in the south part of the Valley.

Many people involved in drainage issues believe that a sustainable, long-term solution to the problems affecting agriculture will have to be accomplished in several phases. The first and probably most critical phase requires solving the problem of toxicants, such as selenium.

At present, more than three million tons of salt accumulates each year in the Valley's shallow groundwater, soils and evaporation ponds. The long-term effect of a continuing failure to manage the salt accumulation problem, of letting present trends continue without implementing a comprehensive management plan, will be to limit severely the future uses and value of Valley lands and groundwater. As gains are made in managing drainage water toxicants in the Valley, the annual salt buildup should be reduced and opportunities will be greater for developing long-term solutions to the salt problem.

No single option is likely to solve a major portion of the Valley's drainage management problems. What will resolve the drainage problem, it is hoped, are certain combinations of options that have been proposed for each sub-area as alternative plans. There are many possible in-valley options to managing the Valley's drainage problems. Most of them are workable only in combination with others, and no single one applies to every problem site. The management options fall into seven categories. And in the short time that I have today, I can give an example, but I'll just briefly list the options.

Source control, which of course includes conservation on the individual farms. Management of shallow water tables by pumping; water treatment, drainage water treatment; water reuse of the drainage; water disposal in the Valley of drainage; fish and wildlife measures, such as altered sequence of water delivery, as discussed earlier today; and institutional changes which Greg Thomas will deal with today.

The executive summary, which is part of my attachment two, outlines more fully these option and gives many examples.

All in-valley alternatives must be exhausted before the examination of drainage effects on out-of-valley receiving environments. More emphasis must be placed on economic constraints and institutional gridlock, as it has been described by some.

We are entering the critical last year of this five-year program, and individual agency interests must be secondary to the range of alternatives raised, discussed and evaluated. There must be procedural freedom within the program and assurance that good alternatives are not altered to satisfy any one agency's particular objectives.

Because this program concludes in October of 1990, it would be premature to recommend specific legislative or administrative reforms at this time. However, may I suggest that this Senate Committee join with its House counterpart and hold join hearings at the conclusion of this program's efforts to evaluate not only the recommended alternatives, but also the Bureau of Reclamation's role during the course of the program, with special emphasis on the coming year.

Was the Bureau open, receptive, cooperative and helpful? Was the program money being spent wisely and efficiently? What remaining issues need Federal attention? Who pays? And how much?

In conferring with my colleagues about the Bureau of Reclamation's role in California water resource management, in response to the three questions accompanying the hearing announcement, I was surprised by the almost unanimous initial negative reaction. Comments ranged from "out of California" to "seeing is believing," before we could move on to discuss ways for the Bureau to participate in resolving drainage issues. Which leads me to the questions posted by Senator Bradley.

How should the Bureau implement its new mission in California? The Program Management Committee of the San Joaquin Valley Drainage Program is a good example of activities suitable for the Bureau's participation.

It's impossible to earn a new image while at the same time retaining an old philosophy. If an agency has long held preconceived objectives and programs, it often chooses to deal in tortured assumptions and no more than ritualistic attention to public input. The Bureau does not yet enjoy a neutral reputation, because traditionally, it has been aligned primarily with certain segments of society. It needs to earn that reputation in California for a real commitment to working jointly with other agencies, to maintaining an open mind as it examines comprehensive planning, and to including all publics, not just friendly supporters, from the outset.

Unless and until its attitudes and traditional patterns of behavior go beyond its reputation for being a "behind-the-scenes operator" quote, unquote, the Bureau cannot and will not be equipped to fulfill its new mission.

Making this transition from federally subsidized irrigation to resource management will not be easy. It will be necessary to examine staff requirements and inservice training for those employees who will remain through the transition from construction to resource management.

What new disciplines will be required? So my comment about staffing is not only to more staffing, but to different kinds of staffing, as you change your mission you must look for new disciplines to carry cut that mandate.

Others have addressed the contract negotiations, but let me note that one cannot have a new Bureau if 40 year contracts are not reevaluated before renewal. How could this help correct drainage problems? Perhaps by additional terms and conditions based on irrigation practices, conservation, shorter renewal contracts, as Mr. Maughan mentioned, ten year contracts in the Hoover dealings.

If the emphasis is on bringing in new water to the waterlogged area before the drainage problem is solved, the problem can only grow worse.

I have answers to questions two and three, which I'll leave for your perusal for the sake of time. I would suggest that those are all good questions, and they ought to be asked at the upcoming Senate confirmation hearings of the Department of Interior's Assistant Secretary for Water and Science, and the Bureau of Reclamation's Commissioner. That would provide an opportunity to understand the Administration's philosophy and commitment regarding drainage solutions in California.

So I urge you to use the information and additional questions you have in this hearing in those confirmation hearings, because leadership is very important in helping the Bureau carry out its new mission.

The solution to the drainage problem holds the key to the future of agriculture in California. If we cannot or will not solve this problem, there will be no more water development. We must continue to shine the light of importance on the drainage issue, because we are at the beginning of a process in finding appropriate solutions. There are no simple, easy, inexpensive or noncontroversial answers.

If I have any time, which I doubt, I would like to just briefly introduce the Committee of Water Policy Consensus. I have outlined their activities in my testimony, and I recommend to you a couple of these drainage policies which were adopted by this 12-county organization which represents the San Francisco Bay Area.

The first one I would like to draw your attention to is this. The solution to agricultural drainage problems in the San Joaquin Valley should include consideration of decreases in irrigation, improvements in water use efficiency, modification of agricultural practices, and reduction in irrigated acreage or utilization of unsuitable lands.

I think that's it, so I will submit the rest of it for you, and thank you very much.

Senator **Bradley**. Thank you very much, Ms. Auer.

[The prepared statement of Ms. Auer follows; attachments have been retained in subcommittee files.]

STATEMENT OF JEAN E. AUER,

VICE-CHAIRWOMAN OF THE SAN JOAQUIN VALLEY DRAINAGE PROGRAM'S
CITIZENS ADVISORY COMMITTEE
and
CONSULTANT TO THE COMMITTEE FOR WATER POLICY CONSENSUS

GIVEN BEFORE THE SUBCOMMITTEE ON WATER AND POWER OF
THE SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

AUGUST 29, 1989 SACRAMENTO, CALIFORNIA

My name is Jean Auer. I am Vice-Chair of the San Joaquin Valley Drainage Program's Citizens Advisory Committee to the Program Management Committee and a consultant to the Committee For Water Policy Consensus.

The Citizens Advisory Committee to The San Joaquin Valley Drainage Program consists of fourteen individuals of diverse backgrounds and interests united in their conviction that environmentally and economically sound solutions must be found to the drainage problems of the San Joaquin Valley. A list of Committee members is included with my written statement (Attachment 1).

At this juncture, the Committee is looking at all possibilities from an optimistic prospective grounded in the belief that there is reason for diverse interests to work together in addressing the valley's vexing and complex drainage problems. The Citizens Advisory Committee hopes to contribute to turning these problems into solutions.

STATEMENT OF THE PROBLEM

The valley's drainage problems are almost as old as its irrigated agriculture. As early as the 1890's, some cultivated lands were forced out of production because of salt and drainage problems. Despite a long history of drainage problems, solutions have been fragmented and remain incomplete to this day. The lack of adequate drainage has long been recognized as a serious problem for irrigated agriculture in the western and southern San Joaquin Valley. For that reason, the Federal and State projects that import irrigated water to the area included plans for a master drainage canal leading to the Sacramento - San Joaquin Delta.

By 1975, eighty-five miles of the San Luis Drain, one hundred and twenty miles of collector drains and the first phase of the Kesterson Regulating Reservoir had been completed and were receiving subsurface drainage water from lands in the Federal service area.

By 1983, with the discovery of migratory-bird deaths and deformities linked to the high selenium levels in agricultural drainage water at Kesterson Reservoir, it was clear that the valley's drainage problem involved not only agriculture, but also fish and wildlife resources, water quality and possibly public health.

In mid-1984, five State and Federal agencies formed the San Joaquin Valley Drainage Program to investigate drainage problems and identify possible solutions.

In 1987, the focus of the Drainage Program was directed to planning steps that could be taken to address agricultural drainage and related problems within the San Joaquin Valley itself. Accordingly, the concept of a master drain leading out of the valley is not within the scope of the Program. This focus reflected a need to control conditions and manage problems as close to their source as possible, and to help ensure that areas outside the valley would not be adversely affected by the valley's problems or by steps taken to solve those problems.

The San Joaquin Valley Drainage Program includes the entire valley, but concentrates on the western half (the West Side), where most of the drainage problems originate. The West Side is divided into five sub-areas: Northern, Grasslands, Westlands, Tulare and Kern.

Current agricultural drainage conditions on the West Side present two basic problems: 1) salt buildup and waterlogging of irrigated lands, due to the high ground-water table, which adversely affects crops and productivity, and 2) toxic or potentially toxic trace elements in the shallow ground water, which when drained and discharged to streams, ponds or wetlands, can adversely affect fish and wildlife.

The severity of the toxics problem first became clear at Kesterson Reservoir six years ago. Now, concentrations of drainage-water contaminants and rates of deformities higher than those found at Kesterson are being found associated with evaporation ponds in the Tulare Basin, which is in the south part of the valley.

Many people involved in drainage issues believe that a sustainable, long-term solution to the problems affecting agriculture will have to be accomplished in several phases. The first, and probably most critical, phase requires solving the problem of toxicants, such as selenium.

At present, more that three million tons of salt accumulates each year in the valley's shallow ground water, soils and evaporation ponds. The long-term effect of a continuing failure to manage the salt accumulation problem, of letting present trends continue without implementing a comprehensive management plan, will be to limit severely the future uses and value of valley lands and ground water. As gains are made in managing drainage water toxicants in the valley, the annual salt buildup should be reduced and opportunities will be greater for developing long-term solutions to the salt problem.

POSSIBLE MANAGEMENT OPTIONS

No single option is likely to solve a major portion of the valley's drainage management problem. What will resolve the drainage problem, it is hoped, are certain combinations of options that have been proposed for each sub-area as "alternative plans". Greg Thomas will address "alternative plans" in his remarks.

There are many possible in-valley options to managing the valley's drainage problems. Most of them are workable only in combination with others, and no single one applies to every problem site. The management options fall into seven categories:

Option:	Example(s):
1. Source control: reduction of water use (conservation) by individual farms	Recycle tailwater; shorten furrow lengths
2. Management of shallow water tables by pumping	Pumping more water from below the Corcoran Clay layer
3. Drainage: water treatment	Biological process to reduce selenium
4. Drainage: water reuse	Planting of eucalyptus and saltbush (salt tolerant commercial crops)
5. Drainage: water disposal in the valley	Evaporation ponds which, of course, must be either bird safe or bird free

6. Fish and wildlife resources [illegible]

7. Institutional changes [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Responses to questions

[illegible]

[illegible]

RESPONSE TO QUESTION 1: How should the Bureau implement its new mission in California?

The Program Management Committee of the San Joaquin Valley Drainage Program is a good example of activities suitable for the Bureau's participation.

It is impossible to earn a new image while at the same time retaining an old philosophy. If an agency has long-held preconceived objectives and programs, it often chooses to deal in tortured assumptions and no more than ritualistic attention to public input. The Bureau does not yet enjoy a neutral reputation because, traditionally, it has been aligned primarily with certain segments of society. It needs to earn a reputation in California for a real commitment to working jointly with other agencies, to maintaining an open mind as it examines comprehensive planning and to including all publics, not just friendly supporters, from the outset. For example, it should more fully open itself to university research and input.

Unless and until its attitudes and traditional patterns of behavior go beyond its reputation for being a "behind-the-scenes operator", the Bureau cannot and will not be equipped to fulfill its new mission. It must show by action and deed that there is a new Bureau, open and committed to upfront public input; in fact, it should seek opportunities to solicit a wide spectrum of public opinion.

Making the transition from federally supported construction to resource management will not be easy. It will be necessary to examine staff requirements and in-service training for those employees who will remain through the transition from construction to resource management. What new disciplines are required? The Bureau's cooperation with state officials and other interested parties, which has increased dramatically in recent years, will constitute the Bureau's real test in the coming decade. Federal-State cooperation, coupled with technical and citizens input, will lead to improved solutions to complex problems.

Others will address the contract negotiations, but let me note that one cannot have a new Bureau if forty year contracts are not reevaluated before renewal. How could this help correct drainage problems? Perhaps by additional terms and conditions based on irrigation practices, conservation, shorter renewal contracts, etc. If the emphasis is in bringing in new water to the waterlogged area before the drainage problem is solved, the problem can only grow worse.

RESPONSE TO QUESTION 2: What opportunities, that have not yet been fully taken advantage of, exist for mutually beneficial cooperation between California's environmental and water development interests?

Close working cooperation among Federal and State agencies was lacking until the Program Management Committee was formed. Vehicles and mechanisms for discussion, rather than confrontation, really have not existed during the "circle the wagons" thinking that has traditionally prevailed. The public wants to, and should be, an active partner in laying out, evaluating and comparing alternatives.

It is important to provide for public participation and then to package the parts which survive public scrutiny and technical review into both a short-term (year 2000) and long-term (year 2040) recommended plan.

More emphasis on economic analysis is absolutely mandatory. The old cost/benefit ratio formulas are no longer applicable to the complexities of drainage solutions. Federal support, both financially and administratively, will be required to protect successfully both the environment and the agricultural community.

RESPONSE TO QUESTION 3: How might the Bureau foster cooperation between California environmental and water development interests?

Frankly, I do not think that is a proper role for the Bureau at this time. Obviously, the Bureau needs to play a participatory role, but it would be inappropriate to assume a leadership role. Working cooperatively with other State and Federal agencies, as outlined earlier, is the Bureau's proper function.

One possible immediate contribution would be for the Bureau to support continued development of the data base, research and documentation of drainage issues. Forty million dollars will have been spent when this program concludes next year and all of this information needs to be available and easily accessible to interested parties and concerned citizens, as well as to government agencies.

Additional appropriations will undoubtedly be needed to continue the development of technologies for on-farm solutions, fish and wildlife protection, public health, etc, and for further assessment of alternatives as they develop.

These are good questions to ask at the upcoming Senate confirmation hearings of the Department of Interior's Assistant Secretary for Water and Science and the Bureau of Reclamation's Commissioner. That will provide an opportunity to understand the Administration's philosophy and commitment regarding drainage solutions in California.

Finally, I would like to turn to the work of the Committee for Water Policy Consensus. The committee is composed of a broad-based and balanced group of diverse interests from the twelve county San Francisco Bay - Delta area, an area that is home to more than seven million people. This committee of private and public leaders includes elected officials, representatives from business, industry and labor, water agencies, environmental and public interest organizations, agricultural interests, the academic community and individuals with water resources expertise.

In 1985, a task force studied drainage issues and recommended a set of policy statements to the full committee for adoption. The ten adopted policies are included (Attachment 3) with my written statement. Please let me draw your attention to three in particular:

1. "The solution to agricultural drainage problems in the San Joaquin Valley should include consideration of decreases in irrigation, improvements in water use efficiency, modification of agricultural practices, and reduction in irrigated acreage or utilization of unsuitable lands."

2. "The water quality of the San Joaquin River as well as all other Delta water supplies must be protected from adverse impacts of salt and toxic pollutants entering from surface and subsurface drainage and any other sources of contamination. In any solution, beneficial uses of the San Joaquin River must be protected."

3. "Any solution to the San Joaquin Valley drainage problem must be part of a total management plan for the water resources of the Central Valley. Problems must not be solved for the San Joaquin Valley by transferring them elsewhere to the detriment of water quality and habitat in other areas, in particular the Delta and San Francisco Bay system and its receiving waters."

Earlier this year, the Committee presented its comments on the Bureau's draft Environmental Impact Statements covering proposed water contracting programs in the Sacramento River, American River and Delta Export Service Areas. I commend your attention to several points.

The Bureau's history of paper promises to protect such beneficial uses as fish and wildlife - - and to mitigate negative impacts - - combined with a record of practices that has precipitated substantial declines in fish and wildlife resources gives us pause.

The Committee for Water Policy Consensus believes that pricing and repayment policies for all future contracts and all future projects should provide that beneficiaries pay their full share of costs associated with the development and operation of those facilities to encourage efficient use of Central Valley Project water and with the intent that subsidies be reduced and eventually eliminated. If subsidies continue to be provided, they and the intended beneficiaries of such subsidies should be explicitly identified and the subsidies should be permitted only to the extent consistent with Federal and State laws.

The solution to the drainage problem holds the key to the future of agriculture in California. If we cannot or will not solve this problem, there will be no more water development. We must continue to shine the light of importance on the drainage issue because we are at the beginning of a process in finding appropriate solutions. There are no simple, easy, inexpensive or noncontroversial answers.

CONCLUSION: RECOMMENDATIONS

1 Joint Congressional hearing at conclusion of Program Management Committee five year program

2 Inclusion of San Joaquin Valley drainage issues at Senate confirmation hearings of Interior appointees

3 Establishment of a center for all data, studies, reports and materials regarding the drainage program, easily accessible by all interested parties. Could be at Fresno State Research Center, through the University of California system (Berkeley or Davis), or other facility

4 Inclusion of the public at the outset on Bureau of Reclamation resource management decisions

Thank you for this opportunity to comment.

ATTACHMENTS

No. 1	Citizens Advisory Committee members
No. 2	Preliminary Planning Alternatives for Solving Agricultural Drainage and Drainage-Related Problems in the San Joaquin Valley, August 1989
No. 3	Packet of general information on Committee for Water Policy Consensus, including San Joaquin Valley Drainage Policies
No. 4	June 22, 1987 Citizens Advisory Committee Resolution on Federal Funding
No. 5	May 27, 1988 Citizens Advisory Committee letter to Secretary Hodel, with Policy Statement on Repayment of Kesterson Reservoir Cleanup and the San Joaquin Valley Drainage Program Costs

Senator **Bradley**. Gregory Thomas.

STATEMENT OF GREGORY A. THOMAS, PRESIDENT, NATURAL HERITAGE INSTITUTE

Mr. **Thomas**. Yes, Senator Bradley and Mr. Fazio. I am Greg Thomas, I'm the president of a new institute called the Natural Heritage Institute, a nonprofit organization. I have provided a more refined version of my statement to you this afternoon, and it's there for you. What I'll do in my ten minutes is just quickly summarize it if I may.

The role of the Natural Heritage institute in the drainage program is as grantees of the Federal Government in investigating the legal and institutional challenges that this problem presents. This inquiry necessarily entails critical examination into existing arrangements, and existing vested interests, and is for that reason controversial and fraught with political landmines.

Before stepping on any of those today, I do want to emphasize that my remarks reflect the perspectives of the Institute only, I do not presume to speak for the program, although I shall be speaking about it.

Jean Auer has characterized the problem, and I won't say much more about that, other than to point out that we're dealing here with an area of irrigated agriculture that does not lend itself well to large applications of water, for the reasons she pointed out.

The study area, which involves the west side of the San Joaquin River and the Tulare Basin to the outside, involves some two and a quarter million acres of irrigated lands. Here the water is applied generally through surface furrows, only about one-sixth of the water is sprinkled, and even much less is drip irrigated.

As a result, the average irrigation efficiency is only about 66 percent, compared to about 80 percent as a benchmark for a high level of efficiency. About a third of that water that's applied accumulates as drain water. Improved irrigation efficiency could cut that volume in half, and in the process, substantial quantities of surplus water could be freed up to be reallocated for environmental enhancement purposes.

One explanation for the low irrigation efficiency may be the cost of irrigation water to the growers. Averages in the subsidy area range from $16 to $50 per acre foot. That compares with figures as high as $200 per acre foot for recent urban water purchases. Of course, this information tends to be anecdotal, and it's difficult to derive a fair market value for the water where there isn't a market in effect.

So how serious are the drainage problems on the west side of the Valley? Well, the Program's early projection is that in the absence of new initiatives, some 40 percent of the land area in the study area will have problem drainwater, which means groundwater within five feet of the root zone, by the year 2000. Longer term projections are even more sobering.

The Central Valley water has been finding its way into this area now for about 40 years. If that continues for another 50 years, the projection is that some 780,000 acres, or about one-third of the farmland in that area will be so severely impacted by this problem that much of it may have to be retired. That's an area, if you want to picture it as a square, about 35 miles on a side.

Well, that's one dimension of the problem, the waterlogging and the effects on crop productivity. The other dimension of the problem, of course, is the disposal of the toxic drainwater in the biosphere. It has to go somewhere, and this is part of the problem that the San Joaquin Valley Drainage Program is looking at.

Well, like other hazardous byproducts of an industrial age, the preferred solution obviously would be source reduction. But only about half of the problem is likely to be solved in that fashion. There will always be a large residual accumulation of this toxic drainwater that has to go somewhere.

Well, the study area basically consists of two basins, the San Joaquin watershed at the north, and the closed Tulare Basin to the south. For the San Joaquin watershed, the easiest disposal option, obviously, is to put this drainwater into the river itself. And indeed, during the irrigation season, almost the entire flow of the middle section of this river is agricultural drainage water. But as you know from testimony you've heard this morning, this river system is much abused and sorely stressed, and is not for that reason, likely to be able to accommodate much more disposal of toxic drainwater.

In the southern study area, the Tulare Basin, the method of disposal that has been used is evaporation ponds, and there are already some 23 ponds covering some 7500 acres. These, however, have the drawback of posing serious threat to waterfowl, a la Kesterson, and this is happening in some of the ponds, bioaccumulation of selenium is known to be occurring in waterfowl. And bear in mind that these artificial water bodies are often the only surface water option for waterfowl in that area along the Pacific Flyway.

Well, those two disposal possibilities implicate the morass of Federal and State laws governing water pollution and hazardous waste disposal. And the Institute has prepared a 150-page summary of the difficulties, legal and institutional, that are involved with those disposal modes. A brief summary is attached to the testimony. The entire document we'd be glad to make available to you, with the permission of the Program to whom it belongs.

Well, the point I'm trying to make is that these problems are severe, and the cost of not solving the problem is so high that it really is not an option. And that's the common ground that brings all of the affected interests and parties together. It's just clear that no one's interest will be served by continuation of the status quo.

That means introducing whole institutions to new tricks. The drainage problem, after all, is not an accident, it's a product of those laws that govern the acquisition of water and the disposal of water, and the institutions that develop liter and consume it, and the economic rewards and penalties that attach to these activities.

So the solutions will necessarily entail changes in these laws and institutions, and inducements. The trick will be to devise reallocations of rights and responsibilities, such that all the stakeholders can benefit, and we are in the process of developing institutional scenarios designed to do just that.

Jean Auer has described the drainage program in sufficient detail. Let me just talk quickly about the legal and institutional investigations. This component of the program did not begin until mid-1988. Before getting into it, perhaps I ought to describe how we got started.

Institutions, of course, do not readily welcome, must less commission, investigations into their own policy failures. And I believe it was a bold and commendable step by the San Joaquin Drainage Program to reach out of the ranks of its cooperating agencies to do this.

And this is the more true in this particular case, because of my background as an environmental advocate for many years on behalf of some organizations you've already heard from today, including the Natural Resources Defense Counsel and Sierra Club and others. I've somewhat purged that taint perhaps, through some years in the academic world as well, but the fact is, the Program knew when they hired me that they were hiring someone who was going to be serious in looking critically at the problems of all the institutions that are involved here.

So to the extent that this represents tangible evidence of the Program's earnestness in seeking solutions, I think it's to be commended. And to the extent that it reflects upon the Bureau, it does indicate perhaps some new sense of mission.

Well, so what are we going to do in these institutional investigations? As the Subcommittee well knows, the area of water law and policy is no longer the staid and stable field that it once was. At every level in every institution, innovations in law and policy are evolving. The institutional investigation is an ambitious one, and will intercept this evolution of policy at the frontier across a very, very broad range.

I've attached to the testimony the current scope of work, which lists some twelve substantive areas that we will be getting into. Now, I'm still learning, as I guess we all are, in this California water policy arena. I certainly don't intend to do all this work myself.

What we're doing is assembling a team of experts that really are drawn from all over the country and from a variety of disciplines, who will take on various aspects of this substantive assignment.

So in the process of doing this, we'll analyze the legal concepts and institutional roles that may provide useful problem solving tools for the program.

Let me just conclude very quickly. We will also develop scenarios that will describe a future with institutions doing different things than they're doing today. One of those has been developed to date, we'd be delighted to share them with the Subcommittee as they become mature enough to be worthy of our outside attention. And of course, we will be seeking critical review from other sectors, including the opinion leaders of the agricultural community here.

I recognize I'm out of time, I do just want to say in closing that there are very important opportunities for addressing the drainage problem in the contract renewal process that the Secretary of Interior has before him for decision, and perhaps in the question period I can get into some of those implications.

Senator **Bradley**. Thank you very much, Mr. Thomas.

[The prepared statement of Mr. Thomas follows:]

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Gregory A. Thomas
President

STATEMENT OF
GREGORY A. THOMAS

BEFORE THE SUBCOMMITTEE ON WATER AND POWER SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

REGARDING INSTITUTIONAL AND LEGAL DIMENSIONS OF THE SAN JOAQUIN VALLEY DRAINAGE PROBLEM

Mr. Chairman, I am pleased to appear before the Subcommittee today to describe the legal and institutional investigations into the agricultural drainage problem in California that we are conducting for the San Joaquin Valley Drainage Program [SJVDP]. As you know, five state and federal agencies, including the U.S. Bureau of Reclamation, have been collaborating under this Program since mid-1984 to understand and develop solutions to the agricultural drainage problem. The other agencies are the U.S. Fish and Wildlife Service, the U.S. Geological Survey, the California Department of Water Resources and the California Department of Fish and Game.

I am here representing the Natural Heritage Institute. This newly formed non-profit corporation provides counselling and representation to governmental and public benefit organizations in an array of natural resource management challenges. One of the Institute's projects is to investigate and advise the SJVDP on the legal and institutional dimensions of the drainage management problem and to develop receommendations for institutional reform. This necessarily entails critical inquiry into existing arrangements and allocations of rights and duties--arrangements with which powerful interests have become comfortable. The mission is controversial and fraught with political landmines. Before stepping on some of them today, I want to emphasize that the perspectives I am airing are rather unrefined at this stage and are those of the Institute alone. I do not presume to speak for the Program, though I shall speak about it.

Characterization of the problem:

Before describing the potential institutional fixes, it would be useful to characterize the problem. When speaking of irrigated agriculture in California, it is difficult to avoid superlatives. The Central Valley may be the most intensively tilled and irrigated piece of real estate in the world. The massive Central Valley Project and the interconnected State Water Project are without rivals in the number and scale of project works--and in the amount of irrigation water delivered. This publicly-developed water system supports a 7.8 billion dollar per year agricultural industry in the Valley.

Among the heroic measures required to cultivate this desert has been the application of prodigious amounts of imported water. But on the west side of the San Joaquin (including the Tulare Basin), the land is not well-suited to large applications of water for two reasons. First, a semi-permeable clay layer traps percolating irrigation water beneath the crop root zone and causes waterlogging. Second, the soils contain salts and selenium which leach into this high groundwater and concentrate there. If left in place, this toxic drainage imperils crops. If collected and discharged, it threatens the receiving streams, ponds or wetlands and the fish and wildlife that inhabit them. At present, some 3.2 million tons of salts accumulate each year in the shallow groundwater, soils and evaporation ponds of the west side of the valley.[1]

It is this West Side Story--involving some 2.25 million acres of irrigated lands--that is the subject of the SJVDP study. Here, most water is applied by surface furrows. Only about one-sixth of the water is sprinkled and much less is drip-irrigated. As a result, average irrigation efficiency is only about 66%. (80% would be considered a high level of efficiency). On the average, 2.5 acre feet of water are applied to each acre of cropland. About a third of that (.8 acre ft.) accumulates as drainage water. Improved irrigation efficiency could cut that volume in half. In the process, substantial quantities of water could be saved each year--water that could be reallocated to environmental enhancement (to replenish wetlands or to provide fishery flows to the San Joaquin River, for instance) or to higher value (in economic terms) consumptive uses. One explanation of the low irrigation efficiency may be the cost of irrigation water to growers. Averages in the study area range from $16 to $50 per acre foot. This compares to figures as high as $200 per acre foot for recent urban water purchases.[2]

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[1] One reporter has calculated that this quantity of salt is enough to fill a 360-car trainload of salt every day of the year (Tom Harris, McClatchy New Service, Fresno Bee, July 16, 1989). Most of that salt buildup takes place in the closed Tulare Basin because the northern areas of the valley maintain a salt balance by flushing the excess through the San Joaquin River.

How serious are the drainage-related problems on the west side? The Program's early projection is that in the absence of new initiatives 40% of the land area on the west side will have problem drainwater (groundwater within 5 feet or less of the land surface) by the year 2000. Longer range projections are even more sobering. The valley has been applying CVP water for about 40 years. If it continues to do so in the manner it does today for another fifty years, the amount of problem drainage to be managed will treble and some 780,000 acres--about one-third--of the farmland in the Valley may go out of production. If you picture that as a square area, it would extend 35 miles on each side. This does not include crop losses on lands with impaired productivity that are not retired.

The disposal of the toxic drainage water is the other dimension of the problem. As the Subcommittee well knows, the Kesterson poisonings were instructive. That incident spawned the

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[2] These costs include a component for pumping and transport. Deriving a fair market value for water in California is somewhat speculative in the absence of a vibrant market for water exchanges. Institutional barriers to water transfers may be part of the drainage management problem and are under investigation by the Institute as part of our scope of work.

Drainage Program and prompted it to give primacy in its planning to in-Valley and non-structural solutions.[3] But the disposal problem remains real, vexing and complex. Like other hazardous by-products of our industrial age, the preferred solution is source reduction. But that will solve only about half of the problem by volume. There will inevitably be a residual accumulation of drainage requiring disposal. Some soils within the study area require periodic leaching of the salts in order to remain productive.

The study area consists of two basins. The northern portion is within the San Joaquin watershed which forms the southern branch of the San Francisco Estuary. Here, the easiest disposal option is the River itself. Indeed, during the irrigation season, agricultural drainage water provides almost the entire flow of the middle section of the River. But this much-abused River is already sorely stressed. Its salmon fishery has been virtually eliminated. Even during high-flow periods, it has limited ability to dilute toxic discharges. And, what goes into the San Joaquin River in the Central Valley comes out in the San Francisco estuary, currently the subject of protracted proceedings before the State Water Resources Control Board to set water quality standards to protect its deteriorated environmental resources.

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[3] In 1987, the SJVDP narrowed its focus on planning alternatives to measures that could be taken to address drainage and related problems within the valley itself. Accordingly, the concept of a master drain leading out of the valley is not within the scope of the program. However, the Program also notes that the magnitude of the salt accumulation problem is so large--3.3 million tons per year--that it cannot be solved, over the long term, solely in the Valley.

The southern portion of the study area is in the closed Tulare Basin. Here, there is no natural outlet to the sea, and no river to use as a sink. Evaporation ponds are the straightforward disposal option for this area. Already, some 23 ponds covering 7,500 acres exist in the Central Valley. Some pose serious threats to waterfowl and there is extensive evidence that selenium is bioaccumulating in the tissues of water fowl, sometimes to the point that advisories have been issued by the State to restrict human consumption of these animals. Some have toxicities approaching that at Kesterson and, like Kesterson, pose attractive nuisances to waterfowl. These ponds are located along the Pacific flyway, in a stretch that affords few other surface water options to migrating birds.

The skein of federal on top of state regulations implicated by each of these disposal options is so complex as to virtually swim before the eyes. The Institute has produced a 150 page analysis of these issues for the Program. With the permission of the Program, I would be glad to make that document available to the Committee, if it would be useful. A brief summary is attached to this statement.

The point I wish to make here is that the cost of not solving the drainage problem in all its dimensions--is simply too high for all stakeholders alike--growers, environmentalists and bureaucrats--to make "business-as-usual" an acceptable option.

The common ground is the imperative that the problem be solved. That means introducing old institutions to new tricks. The drainage problem is not an accident. It is a product of the laws that govern the acquisition, use and disposal of agricultural water; of the institutions that develop, deliver and consume agricultural water; and of the economic rewards and penalties that attach to these activities. Solutions will entail changes in these laws, institutions and inducements. The trick will be to devise reallocations of rights and responsibilities such that all stakeholder communities benefit. We are in the process of developing institutional scenarios designed to do just that.

The San Joaquin Drainage Program

Before getting further into the institutional overlay, let me describe the Drainage Program and its sense of direction. Again, these are my observations, not necessarily those of the Program officials.

The Program was launched in mid-1984 as a cooperative venture between the Department of Interior and the Governor of California. Its charge is to identify measures to help solve immediate drainage problems and to develop comprehensive plans for long-term management of those problems. The program has a broad resource management orientation. It is concerned not only with agricultural productivity but with the effects of drainage on fish and wildlife resources and on water quality.[4] Program direction and budgetary decisions rest ultimately with a five member Policy and Management Committee comprised of the local heads of the three Interior Department agencies and the heads of the two California agencies. The Regional Director of the Bureau of Reclamation, Lawrence Hancock, represents the Bureau of Reclamation. The Program is to issue a final report and recommendations for action by the end of the 1990 federal fiscal year. The Program is to expire at that point.

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[4] Public health is a further but less worrisome concern.

The funding for the program is shared by the state and federal governments. (In FY 1986 and 1987, the split was roughly 40% federal and 60% state.) The Federal share is primarily through annual Congressional appropriations to the Bureau for the San Luis Unit of the CVP. A portion of the federal investment is subject to repayment obligations by the beneficiaries. Terms and conditions of repayment are to be determined by the Department of Interior. Some contribution is also made by the Fish and Wildlife Service and the the U.S. Geological Survey. The total cost for the five years of the Program's life will probably be $40-50 million. Some $30 million will be absorbed by technical studies to illuminate the nature and etiology of the problem and to identify the best technical fixes. The largest budgetary commitments have been for investigating the geology and hydrology of the study unit, the feasibility of treatment and disposal processes and sites, and the toxicological threats to fish and wildlife.

The Program's Current Sense of the Alternatives:

Some of the Program's preliminary understandings at this stage are rather interesting.

Source control--reducing the amount of drainage water produced--is an obvious and efficacious strategy, but not a complete one. Improved efficiency measures--such as better irrigation management and scheduling and such technologies as shorter furrows and tailwater return systems are predicted to reduce drainwater production by only 40-50% in most zones. Even with further techniques such as sprinkler or drip systems, lining of canals, and better tillage practices, substantial residual drainwater will have to be managed.

The alternative plans developed by the program to date contemplate a cascade of steps to first concentrate the minerals in the drainage by applying it to salt-tolerant plants, such as eucalyptus and saltbush, that would evapotranspirate much of the water, and then to store the residual volume in either evaporation ponds or underground, or in the Northern reaches, to discharge it directly to the San Joaquin River.[5]

To make room for underground storage, two types of strategies are under consideration: (1) pump out existing aquifers so more drainage water can be stored underground; (2) pump the drainage water itself and discharge it into the San

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[5] Treatment options have been investigated by the Program. Most of these options are still in the laboratory test stage. There are no immediate prospects for an economically feasible way to remove selenium from drainage water.

Joaquin River during high flow periods. The first presents interesting legal questions regarding the contamination of groundwater sources by intruding drainage water. The second presents a host of legal problems regarding water quality regulation of surface waters, addressed, in part, in the attached summary of disposal options.

The Legal and Institutional Investigations:

This component of the Program is being carried out by the Natural Heritage Institute. It was not initiated until mid-1988. The purpose of these investigations is to understand how and why existing structures have contributed to the problem, and to understand how these structures may best be modified to implement the drainage management solutions that the Program is in the process of identifying. Before describing just what we are doing in these investigations, it may be helpful to the Subcommittee to describe how we got started.

Institutions do not readily welcome, much less commission, investigations into their own policy failures. It was a bold, commendable and perhaps unprecedented step for the SJVDP to reach outside of the cooperating agencies to do so. That is the more true in this case where the investigator comes from an environmental advocacy and law reform background, about which I have made no secret.[6]

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[6] I have spent many years representing the critics of governmental resource policies, including the Natural Resources Defense Counsel, the Sierra Club and a host

Understandably, the idea of commissioning an institutional investigation in these circumstances was controversial in some quarters. While comforting the skeptics delayed the commencement of this project, the perseverance of the Program in overcoming the obstacles to an institutional investigation I take as tangible evidence of the Program's earnest desire to solve--not to paper over--the drainage problem in all its dimensions. If I was not convinced of that, I would not have taken on this project. Government bookshelves do not need yet another multi-volume study gathering dust. To the extent that this sincerity reflects a new sense of mission in the Bureau, it is consonant with its 1987 announcement of a "new direction" and should be commended.

As the Subcommittee knows well, the law of water resources at both the state and federal levels is no longer the staid and stable field that it used to be. In fact, the legal doctrines and management policies are now evolving in the Congress, in the legislatures, in the courts and in the regulatory agencies at a feverish pace. The institutional investigation is ambitious in scope and will intercept the evolving concepts of water resource law at their frontier. To address these complex and highly-specialized topics, we are in the process of assembling a team of experts that will number about a dozen, interdisciplinary in

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of other environmental organizations. I have also been counsel to government entities in a variety of capacities.

background, and nationally prominent in their fields. This team has three tasks:

1) To analyze legal concepts and institutional roles that may provide useful problem-solving tools. An itemization of these task elements is attached.

2) To analyze alternative institutional arrangements suggested by the Program staff in their process of narrowing the universe of promising water management reforms. A current list of these targets for inquiry is also attached.

3) To develop and compare an array of alternative institutional arrangements that illustrate how the entire complex of institutional players could interrelate in solving the drainage problems. These scenarios will consider the changes in laws, policies, powers and regulations that appear to be needed to delineate new and more efficacious roles for the existing institutions, including the Bureau of Reclamation. To date, one such alternative scheme has been developed and is undergoing internal review. We would be pleased to provide these papers to the Subcommittee as they become sufficiently refined for outside review. We shall also seek the review and counsel of the various stakeholders as we develop institutional options--especially the opinion leaders of the agricultural community such as Jerry Butchert and Steve Hall who are on the panel here today.

Though we have far to go before we rest, I can give you a preview of some of our thinking at this early stage. An optimal solution may well include an enhanced role for the local irrigation districts in both source reduction and management of residual drainage water. The districts may be the institutions best able to effect meaningful reform of irrigation practices on the farm, and can most readily provide the structure for drainage elimination or collection, management and disposal. Some of the districts are already at the forefront in experimenting with novel management techniques. Most will have be "retooled" to some degree to provide this broader mission through additional mandates and/or inducements.

These mandates may be imposed through either, or a combination of, new state legislation, new regulation under the water pollution control agencies, or new contractual obligations imposed by the water development agencies. The predominant water supplier in the Central Valley is the Bureau of Reclamation. It delivers water to the local districts pursuant to long-term contracts whose terms and conditions cannot be unilaterally altered, of course. But, as the Subcommittee is aware, the initial series of CVP contracts with California water agencies are reaching the end of their 40 year terms and are coming up for renewal.

The first of these to be renegotiated, the Friant Unit contracts, have generated considerable controversy over whether the decisions to renew, and under what terms and conditions, are subject to the National Environmental Policy Act's requirements for the preparation of an environmental impact statement for major federal actions significantly affecting the quality of the environment. An initial opinion by the Solicitor that NEPA compliance is not required has been vigorously contested by environmental organizations, who have filed suit in federal court; by the Environmental Protection Agency (Region IX) which has advised the Regional Director of the Bureau that an EIS is required under the law; and by the President's Council on Environmental Quality which recently sided with EPA in the controversy. In the wake of these developments, we understand that Secretary Lujan has recently announced his intention to reconsider the issue.

This Secretarial decision has important ramifications for the Drainage Program. It seems clear that the next generation of contracts could be shaped to help alleviate the drainage and associated fish and wildlife problems in the Central Valley. That is an opportunity to arrest a serious environmental management problem to which the reclamation program has obviously contributed and the solving of which is a particular responsibility of the Department. The NEPA process of defining and analyzing alternative courses of action provides an excellent framework for the Bureau of Reclamation to consider imposing new contract obligations on the local irrigation districts, designed to help solve the drainage problems. The SJVDP institutional investigation team's analysis of potential contract reforms may facilitate this aspect of the NEPA review, should the Department decide to comply. We would be pleased to provide the Department whatever assistance may be desired.

I am concerned that the opportunities to correct the drainage problem through contract terms and conditions not be foreclosed, as they would be by renewal of the expiring contracts in their original form. I have recommended to the SJVDP that it make the Secretary of Interior aware of the implications that his decision may have for the Bureau's drainage program and urge him to either:

(1) conduct a programmatic environmental review that considers among the alternatives evaluated in the impact

statement an array of contract modifications that would facilitate drainage solutions, or

(2) include in the renewed contracts a provision in effect reserving in the Bureau the power to modify the contracts as may appear desirable to implement drainage solutions, after the Program has completed its investigations and rendered its recommendations.

The old contracts reflect policies and priorities of the old Bureau of Reclamation, before the new policy direction of 1987. That policy proclaimed that "Conservation of water and protection of the environment ... form a basis upon which the goals and objectives for a 'New Bureau of Reclamation can be established." Attention to the drainage problem in the contract renewal process is an important opportunity to actualize that new sense of direction.

In closing, Mr. Chairman, I note that your invitation to testify asked for specific recommendations for legislative or administrative reform. Developing such recommendations is the Institute's particular role in the San Joaquin Drainage Program and that work is in progress. We expect to have quite elaborate recommendations to share with the Subcommittee by this time next year. Your active and continuing interest in this work is essential, since it is to the Congress that some of the recommendations for new law are likely to be addressed. A further hearing on the Drainage Program and its products about this time next year would be an excellent way for us to communicate those recommendations to you.

Thank you for the opportunity to address the institutional and issues raised by the San Joaquin Valley Drainage Program.

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Gregory A. Thomas
President

SUMMARY AND UPDATE OF PRELIMINARY REPORT ON OPTIONS FOR DISPOSAL OF SAN JOAQUIN VALLEY DRAINWATER: INSTITUTIONAL AND REGULATORY CONSTRAINTS AND OPPORTUNITIES

This is a brief summary of the institutional and regulatory lacuna faced by both private and public interests in developing options for drainage disposal.

The Environmental Protection Agency (EPA) interprets the Clean Water Act (CWA) to require minimal federal regulation of the State's nonpoint source or agricultural water pollution. Pursuant to the CWA, the State has developed a nonpoint source pollution control plan. The plan seeks to reduce pollution from nonpoint sources, including agricultural drainage discharges. The Regional Board will continue to study the agricultural drainage problems in the San Joaquin Valley. EPA is expected to certify the program once its review is complete.

Drainage discharged to the San Joaquin River is regulated primarily by the State in its basin planning process. The Central Valley Regional Water Quality Control Board has developed a controversial basin plan for the San Joaquin basin. The Regional Board's plan must be approved by the State Water Resources Control Board and EPA. The State Board is expected to certify the plan in September of this year. However, EPA has informally indicated that it may not approve the plan because it fails to meet the goals of the CWA. The RWQCB has apparently developed two sets of objectives for the same beneficial uses, emphasizing objectives which are 'attainable' though not necessarily fully protective. Enforcement mechanisms in the plan are weak. The Regional Board has little or no authority to enforce the provisions of the plan without reinstituting lengthy proceedings.[1] These barriers may result in ineffective regulatory oversight or implementation of valleywide drainage disposal solutions.

There are barriers to the long-term use of the River for drainage disposal. EPA has determined that both the San Joaquin River and the San Luis Drain are impaired waterbodies requiring State corrective measures pursuant to Section 304(l) of the Act. Disposal of drainage in the northern reaches of the San Joaquin River may violate the anti-degradation provisions of the CWA because it degrades Bay-Delta waters. A policy encouraging this type of disposal without treatment may be prohibited.

Despite this, the Regional Board has adopted a policy that a Valley-wide drain is the best strategy for eliminating subsurface drainage water. The State Board is expected to approve a pending request by one of the Valley's districts for funds to reoperate the San Luis Drain to discharge drainwater into the northern reaches of the River. If, in an effort to meet both state and federal requirements, growers use freshwater to dilute the drainwater before discharging it to the River they may violate the State's ‘reasonable and beneficial use of water’ doctrine.

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[1] For example, while the Regional Board has legal authority to do so, will not require permits for discharges. Absent permits, the State Board is loath to take affirmative enforcement action.

Disposal of drainage in evaporation ponds creates no less of an institutional and regulatory dilemna. Long-term use of evaporation ponds to dispose of drainage water containing toxic constituents, such as selenium, is contrary to the federal policy to minimize or eliminate land disposal of hazardous waste. Some ponds in the Valley already exceed the legal ‘hazardous’ threshhold. Congress declared, in amending the Resource Conservation and Recovery Act, that surface impoundment is the least favored method for managing hazardous waste.

There is a similar State policy for ponds containing selenium-laden drainwater. At least one farm's pond has become so concentrated with toxic constituents that cleanup pursuant to the State's Toxic Pits Control Act may be required. Cleaning the pond is estimated to cost 30-50 times the farm's value. Recently, however, the State excepted agricultural drainage ponds from certain state siting and design criteria until January 1, 1993, if the ponds are operated to prevent the migration of contaminants and the endangerment of wildlife.

U.S. Fish and Wildlife reports indicate that many ponds in the Valley pose serious threats to wildlife. Waterfowl death and deformity result from the bioaccumulation of selenium in bird tissue. The frequency of duck deformities near one pond is higher than those observed at Kesterson. Many of the ponds are in violation of the Migratory Bird Treaty Act (MBTA).[2] Certain species in the area are or are candidates for Endangered Species Act (ESA) listing. Violation of these Acts may subject those who own and operate ponds to criminal and civil liability. The Service has not yet sought to enforce the liability provisions of the MBTA or ESA. Despite these problems, there are applications pending for construction of ponds encompassing over 10,000 acres of land in the Valley.

U.S. Fish and Wildlife is working with the Regional Board and pond owners to determine whether ponds can be operated to prevent risk to wildlife. The Regional Board has required pond owners and "potential" pond owners to complete a joint environmental impact report on the cumulative impacts of evaporation ponds on wildlife.

There are no easy solutions to this dilemna. As institutional consultants to the SJVDP we are reviewing the opportunity for legal reform to remove barriers in some areas and investigating the need for further regulation in other areas.

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[2] Both U.S. Fish and Wildlife Service and the Regional Board have made this determination--the Regional Board most recently in a letter to pond owners.

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INSTITUTIONAL AND LEGAL INVESTIGATIONS FOR THE SAN JOAQUIN VALLEY DRAINAGE PROGRAM

TASK ELEMENTS TO BE ASSIGNED TO SUB-CONSULTANTS

I. Issues arising under California water rights law--surface waters:

  A. Establishing a system of "water rights" for -non-consumptive (instream uses)

    1. models and lessons from other jurisdictions (e.g. Colorado)

    2. feasibility of incorporating a system of instream water rights in California--how to confer priority sufficient to enhance environmental values

  B. The reasonable and beneficial use doctrines:

    1. extent to which they constrain the use of freshwater to dilute contamination-laden drainwater for reuse, discharge or disposal

    2. extent to which they may limit applications of water for the purpose of leaching salts from soils

    3. what are the limits to reasonable and beneficial use, i.e. what constitutes "waste" in agricultural applications and how efficacious are the legal mechanisms and institutional responses in curtailing such practices?

  C. Under California law, who owns or has legal responsibility for managing (including conveyance, treatment, disposal, and regulatory compliance) of subsurface agricultural drainage water? Does the source(s) [e.g. riparian water, groundwater, district developed water, CVP or SWP water] of the applied irrigation water affect ownership or management responsibilities for drainage water?

D. What is the nature and extent of rights to conserved or salvaged water, and what are the legal complications in transferring (selling) that water, if any, under California water rights law ?

II. Issues arising under California water rights law--groundwater:

A. What are the limits imposed by groundwater administration laws to:

1. pump groundwater to lower the water table?

2. manage the shallow groundwater table to increase crop evapotranspiration?

3. temporarily store drainwater in the shallow groundwater aquifer?

4. dispose of drainwater by injection into deep aquifers or geologic formations?

5. what are the implications for these options if the basin is overdrafted?

B. Under what circumstances could a grower or district be required to pump groundwater or subsurface drainwater?

1. Under joint operating agreements?

2. Under basin agreements with districts?

3. If the owner has riparian, appropriative or prescriptive rights?

C. What are the limits to using groundwater to dilute contaminated drainwater--either for the purpose of meeting discharge standards or for reuse in irrigation

D. Are authorities for establishing local conjunctive use programs adequate? To what extent may these programs be designed or tailored to address regional drainage problems?

III. The "Public Trust Doctrine":

A. What is the utility and limitation of the public trust doctrine in reallocating water from irrigation to environmental enhancement purposes ? Consider the doctrine as it has evolved in California and nationally.

B. What opportunity does the public trust doctrine present in managing groundwater for drainage reduction?

IV. Water pollution--water quality law:

A. How do state and federal laws regarding degradation of groundwater constrain options that might entail intrusion or disposal of contaminated drainwater? What are the limits or thresholds?

B. How can excessive groundwater pumping be controlled through state or federal restrictions on degradation of groundwater quality?

C. How can excessive leaching be controlled through state or federal restrictions on degradation of groundwater quality?

D. What are the enforcement mechanisms for water quality controls that may apply to disposal of contaminated drainwater? Under what circumstances can water entitlements be curtailed as a remedy ?

E. How may the State Water Resources Control Board and the Regional Boards use their regulatory authority over well operations to manage groundwater and/or drainwater in particular districts?

V. Powers, authorities and practices of the State Water Resources Control Board:

A. To what extent may the Board modify a grower's surface water entitlements to meet water quality objectives or requirements?

B. How may the State Water Resources Control Board and the Regional Boards use their regulatory authority over well operations to manage groundwater and/or drainwater in particular districts?

VI. Federal Reclamation Law and CVP contracting:

A. What opportunities exist for enhancing water quality, and fish and wildlife values in the process of renewing contracts between the Bureau of Reclamation and CVP contractors ?

B. Under federal law, who owns or has responsibility for managing (including conveyance, treatment, and disposal of subsurface agricultural drainage water from the CVP?

C. How much flexibility do current laws, policies, and practices permit in pricing terms of CVP contracts?

D. What are the barriers and opportunities under reclamation law for rate changes that would promote water conservation and/or drainage reduction?

E. To what extent may such changes apply to exchange contractors?

F. What constraints exist on the generation or disposition of profits of water districts in creating incentive rates?

G. Does the Secretary of the Interior have the authority to revise the determination that was made at the time of authorization of the CVP that the lands in the service area are suitable for irrigation such that problem areas will no longer be eligible to receive Bureau water?

H. What are the laws and policies that maintain the irrigation water subsidies, how do they affect the generation of drainwater in the Central Valley, and how stable are these laws and policies (i.e., what is the prospect of modification through Congressional amendment, policy changes in the Bureau of Reclamation, or litigation)?

VII. State Water Project laws and administration:

A. What opportunities exist for modifying contract provisions between the DWR and SWP contractors to enhance water quality, fish and wildlife, and other public trust values ? May an entity contract for SWP water for such purposes? Under what terms and conditions?

B. Under California law, who owns or has responsibility for managing (including conveyance, treatment, disposal, and regulatory compliance) subsurface agricultural drainage water from the SWP?

C. How much flexibility do the current laws, policies, and practices permit in the price terms or SWP contracts?

D. What are the barriers and opportunities under state law for rate changes that would promote water conservation and/or drainage reduction?

E. To what extent may such changes apply to exchange contractors?

F. What constraints exist on the generation or disposition of profits of water districts in creating incentive rates?

VIII. Water transfers: law:

A. Under California law, what is the nature and extent of rights to conserved or salvaged water, and what are the legal complications in transferring (selling) that water, if any?

B. What changes in law are needed to encourage or facilitate salvage and transfer of agricultural water in California?

C. What is the nature and the extent of the legal barriers to water transfers? These barriers include:

- o legal restrictions on the allocation of profits, changes in project repayment and
- o changes in the areas and types of use.

D. How can these obstacles be overcome?

- o through changes in policies of the Bureau of Reclamation and the Department of Water Resources?
- o through changes in statutory authority?
- o through contract renewals?

E. What special obstacles and opportunities are presented by the terms of CVP water contracts? The SWP contracts? The exchange contracts?

F. How do Federal or California laws or policies affect the amount of "profit" a water entity or farmer can earn through the transfer of conserved irrigation water? Are CVP, SWP, riparian, and groundwater treated the same by the laws and/or policies?

IX. Water transfers: practice:

A. What is the potential role of water transfers to induce improvements in the economically efficient use of agricultural water (e.g. reducing "waste," encouraging conservation, switching to less water intensive crops, and letting land lie uncultivated.)? Potential to induce lands with high contaminant levels to be retired from irrigation? In providing water for fish and wildlife, water quality, recreation, aesthetics, and other non-agricultural uses?

X. Water, irrigation, conservation and drainage districts: powers and authorities:

A. How can districts set and enforce on-farm drainage discharge limits (both quantity and quality)? What additional powers or inducements are needed to set and enforce appropriate limits? How may these be provided?

B. Under U.S. and California laws, who owns or has responsibility for managing (including conveyance, treatment, disposal, and regulatory compliance) subsurface agricultural drainage water? Does the source(s) (e.g. riparian water, groundwater, district developed water, CVP or SWP water) of the applied irrigation water affect ownership or management responsibilities for drainage water?

C. How may drainage fees, progressive block rates, and volume-sensitive rates be implemented by water project agencies and/or water districts? How does the experience of Pacheco Water District and Broadview Water District relate?

D. How may water delivery contracts be amended to link water rates to the volume of use?

XI. Water, irrigation, conservation and drainage districts: practices and performance:

A. How do districts levy and utilize drainage effluent fees? What additional powers or inducements are needed? How may these be provided?

B. How do districts prescribe and enforce on-farm water conservation plans and practices for growers? What additional powers or inducements are needed?

C. What examples of water management entities might serve as models for change? Candidates to investigate might include EBMUD, New Jerusalem Drainage District, Tulare Lake Drainage District, Westlands Water District, and Imperial Water District.

D. Are total water management districts--that would both deliver agricultural water and manage drainwater--an attractive and feasible model for changes to existing irrigation, water, and water storage districts?

XII. Land use law:

A. How can laws and policies be formulated to induce voluntary retirement of problem lands? For instance, how can incentives be created for the transfer of water rights pertaining to such lands?

B. How can a public authority be empowered to acquire problem lands or appertenant water rights through condemnation proceedings? What would be the complications in the resale of those lands or waters to recover the purchase costs?

XIII. Agricultural support and subsidies: federal law and policy:

A. Agricultural subsidy programs may foster economically inefficient use of irrigation water. Two categories of subsidies may be involved: water pricing subsidies; and crop support programs. What are the laws and policies that create these subsidies, how do they shape the programs, and how stable are they?

TYPES OF EXPERTS NEEDED

1. California surface water rights law
2. California groundwater rights law
3. Federal Reclamation Law
4. State Water Project Law

5. The law of water transfers
6. Water district laws
7. Water district fee structures, conservation practices, and other empirical information on operations
8. Authorities, powers and practices of the State Water Resources Control Board
9. Land use law and planning
10. Federal agricultural support and subsidy law and policy
11. Expert on the public trust doctrine
12. Water pollution--water quality law

Institutional Changes

The SJVDP study includes a number of possible changes in laws, policies, and practices in order to help solve drainage problems and to protect fish and wildlife resources. Many of these options provide economic and other incentives for growers to conserve irrigation water and/or reduce the production of agricultural drainage water. The institutions involved include local, regional, State, and Federal water agencies and others.

These options are:

- Raise the price of water through water supply contracts. This would require renegotiation of contracts, and a fundamental shift in Federal and State policies. Preliminary analyses indicate that significant price increases would be needed to motivate growers to change irrigation methods and management.
- Charge higher water rates at the district level, with excess funds rebated or applied to drainage management programs.
- Modify or eliminate irrigation subsidies, including those on Federal and, possibly, State water supplies.
- Allow water districts (and growers) to pay only for water actually used and to receive credit for unused water.
- Use tiered water pricing. This means that per-unit prices increase as subsequent "blocks" of water are used by a grower during a season. Tiered pricing of Federal and State project water would require changes in Federal and State law and/or policy.
- Make it easier to: (1) Trade water, which would increase the value of transfers and thereby encourage conservation, or (2) market water, which, besides encouraging conservation, might eliminate irrigation on lands with severe drainage problems.
- Rebate taxes based on total water management efficiency measured by reduction in subsurface drainage water produced.
- Provide income tax credits for investments in water conservation.
- Authorize use of Federal and State water to dilute agricultural drainage water so the water could meet discharge standards of, for example, the San Joaquin River.
- Impose drainage-effluent fees on growers and/or water districts, in proportion to the amount and quality of drainage water.
- Limit the amount of very poor-quality drainage water discharged from farms, districts, or regions.
- Allow growers to trade permits for off-farm discharge of limited amounts of drainage-water constituents (e.g., selenium, boron, or salts).
- Form a regional drainage district to address drainage and drainage-related problems more effectively and economically. Members could be either water districts or individual growers.
- Increase subsidies on Federal and State project water going to private and public wetlands, in order to improve wildlife habitats.
- Authorize CVP and SWP water for environmental and other uses before agriculture.

- Reauthorize the Federal and State Water Projects to give equal consideration to water needs of fish and wildlife.

- Reallocate water from agriculture to fish and wildlife uses. This would probably require agency agreements and perhaps legislative action. One way to save water for reallocation to fish and wildlife would be to reduce irrigation demand through increased conservation or land retirement. Another would be to redefine "beneficial use" of water to exclude: (1) Production of highly contaminated drainage, or (2) irrigation in excess of crop water use plus leaching.

Senator **Bradley**. Mr. Stephen Hall. Welcome to the Subcommittee.

STATEMENT OF STEPHEN K. HALL, EXECUTIVE DIRECTOR, LAND PRESERVATION ASSOCIATION

Mr. **Hall**. Thank you, Mr. Bradley, Mr. Fazio. Thank you for the opportunity to testify.

I work for the Land Preservation Association, which is an organization that represents 12 water districts that serve approximately a million acres of land in the western San Joaquin Valley. It's the farmland and wetlands that have been most immediately impacted by the drainage problem on the west side.

I won't go into detail about the drainage problem. You've heard descriptions of it. It is a long-term problem that's common around the world, wherever there is irrigated agriculture. And like many resource problems, it's not one that you can solve once and walk away from, we're going to have to manage it as long as irrigated agriculture is in the western San Joaquin Valley.

In fact, I think it's a good example of the kind of issues that the Bureau of Reclamation and all of us in water resources in California will be facing, because it's part of the outgrowth of a system that has now been developed, and has been operating for some time. And as such, problems like drainage have arisen, and they will have to be dealt with, and they will have to be dealt with on an ongoing basis.

The nut of the problem is simply to preserve the land resource that's been developed out there, without sacrificing other elements of the Valley's environment. That's the nut of the problem. It's easy to say, it's a little harder to execute.

I'd like to describe just briefly what has happened at the local level since this issue really came to a head with Kesterson Reservoir. It's been around a long time, but obviously the events at Kesterson changed the focus, although it certainly didn't change the basic nature of the problem. That's, as Jean Auer described, making sure that the soil remains unsaturated, and that you achieve salt balance in the Valley. That's the fundamental problem.

Others have described to you some of the elements of what a solution will look like. They include water conservation, water treatment, and some other measures. And at the local level, we have not been waiting for the Bureau of Reclamation or for anyone else, frankly, to come around and solve those tricky details.

The districts that I work for have instituted in some cases tiered water pricing, Mr. Candee referred to that. Those were the districts that we represent that he was referring to. Thank you, Hal, for the compliment.

Other districts provide loans for on-farm irrigation improvements. Those are not loans that come from money from the Federal or State Governments, those are local funds. Other districts provide irrigation management assistance. And I want to emphasize, as Mr. Kennedy did this morning, that these farmers are not wasting water, they are already among the most efficient in the country. There are incremental improvements that can be made, but these farmers recognize that by making those improvements, they can help solve the drainage problem in a cost-effective way.

I don't want to debate with Greg Thomas over irrigation efficiencies and numbers. Suffice it to say that the debate over irrigation efficiency ranks on a par with what the biological effects in the Bay-Delta are, in terms of who you ask and what kind of answer you get.

So suffice it to say that we believe we have efficient irrigation practices on the west side. They can be made better, and we're in the process of doing that.

With respect to water treatment, removing selenium and other trace elements from any water, particularly this drainage water, is a tricky business. These districts are not large entities in most cases, they don't have a large tax base, they don't have research staff, they have invested over $5 million in the last several years in investigating how to remove selenium and other trace elements from the water. They have really taken the lead in many respects in developing waste water treatment, where drainage water is concerned.

In fact, Westlands Water District, as Mr. Butchert will describe, is involved in a multi-agency effort to develop a research center on the west side to do additional research on drainage water treatment.

Some of the other measures they've been involved with include agri-forestry, growing trees and other vegetation to try to dispose of this water in an environmentally benign way, recycling and wetlands protection, because there is a large wetlands area in the area that we represent that needs to be protected.

Now, I mention these things not just to describe the commitment at the local level to solving this problem in a responsible way, but to highlight the kind of effort that I believe will be needed in order to solve this problem, not just at the local level, but by the bureau and others.

And that's where we come to how the Bureau can help. The Bureau does have a historic commitment to these lands to provide drainage service. That was in the authorizing legislation that established the San Luis Unit, that commitment remains today. And in our view, it should be met.

Just because their original plans didn't work does not minimize that commitment. Currently the Bureau of Reclamation is involved in the San Joaquin Valley Drainage Program. Ms. Auer and Mr. Thomas described those efforts to you. They've also been involved until recently in the cleanup and closure of Kesterson Reservoir.

Those are worthwhile endeavors, but they will not by themselves solve this problem. In fact, they raise an issue that is of concern to us, and that is the issue of repayment of the costs for both these drainage studies and Kesterson cleanup.

Under current Bureau of Reclamation policy, all of those costs, for both the studies and the cleanup are being assigned to the San Luis Unit. In our view that is inappropriate to the point of being inequitable, and we believe that policy needs to be changed to more equitably distribute the costs. I won't take the time to describe what our views are, but I'd be happy to answer any questions.

In terms of the Bureau's future role, we believe it's incumbent upon the Bureau to recognize that there is no one single solution, there is not going to be a big project in the Valley to solve the drainage problem.

We think that makes it necessary for the Bureau to partner with local water districts that have drainage problems and purchase federal water to develop solutions, even if it's district by district, so that the solutions are cost-effective, can be supported at the local level, and we believe that will make them more supportable by Congress and others as well, because it will be practical and costeffective and environmentally sensitive.

I hate to sound a recurring theme, but I believe that will require, as other speakers have mentioned, that the Bureau hire some new people. Not just do new things, but do them in a new way. And others have said enough about that, I'm sure you've received that message loud and clear.

I personally love engineers, I work with them all the time, but they may need some other hands around the table as well.

Now, in terms of specifics, you did ask us to be specific, and so I will give you some specific projects where we think the Bureau can play an important role in doing some immediate things. Obviously the Bureau is going to have to pick up where the drainage program left off, and do some detailed planning. But beyond that, some immediate measures that can be taken include a project that was originally developed by the U.S. Geological Survey.

The USGS believes that there is water that is hydraulically connected to the shallow, poor quality drainage water that we have to drain, but is of better quality, has virtually no selenium and much less salt. And that water could be pumped.

By extracting that water, you could lower the overall regional groundwater table and reduce the drainage problem. You would also produce a water supply that may be usable, perhaps for irrigation, but more likely for wetlands.

There is a valuable wetlands in the area, as we described, that needs a water supply badly. This is a win win situation potentially, and we think the Bureau should be involved.

Secondly, several districts in what we call the Grasslands area want to use the San Luis Drain, not for what it was originally intended, but it would be to carry drainage water. Right now the drainage water from the farms in the Grasslands area runs through the wetlands, immediately down slope on its way to the San Joaquin River. Now, that water will continue to be discharged to the San Joaquin River, but it will have to meet water quality standards to protect beneficial uses.

What those districts want to do is remove the water from the channels of the wetlands, so that the wetlands can receive better quality water more often, and enable them to better manage their drainage water, and in turn better meet the water quality objectives. That's another area where the Bureau could be of immense help, because as you know, they own and operate the San Luis Drain.

Incidentally, this project has the support of not just local farmers, but local waterfowl and wetlands managers as well.

Senator **Bradley**. Repeat that.

Mr. **Hall**. I'm sorry?

Senator **Bradley**. Repeat that, please.

Mr. **Hall**. Which portion would you like me to repeat?

Senator **Bradley**. Your second point.

Mr. **Hall**. It would improve the situation for the wetlands. It would also make it easier for the farmers and the water districts to manage their drainage water. It gives them greater management flexibility, so that they can better meet the water quality objectives in the San Joaquin River. It's simply a management tool for them. For the wetlands its an enhancement.

Thirdly, all of these districts are going to have to be developing drainage plans. Some of them have to do it as a condition of discharging to the San Joaquin River, others will simply have to do it as a matter of taking care of their problem.

Recently the Bureau of Reclamation sat down with the Westlands Water District to begin some detailed planning on what the Bureau and Westlands might do to solve the problems in that district. I'll let Mr. Butchert describe that in greater detail. But that sort of partnering is just exactly the kind of thing that we believe should be taking place with all of the Districts in the San Luis unit and in the western San Joaquin Valley, where the Bureau sits down with those people, gets input from them, and the benefit of their local knowledge, and can bring some of their own expertise to bear as well.

Finally, there are a number of treatment options that are possible. One of the ones with the most promise is cogeneration. And I see the gavel about to be lowered, so I'm not going to describe it, but that and other water treatment measures are things that the Bureau has a lot of expertise in and can be very helpful in.

Let me close by saying, we appreciate the opportunity to testify, we think drainage can be a great way for the Bureau to start on its new era, its new mission. And we are, as local interests ready to do our share.

Thank you, Mr. Chairman.

Senator **Bradley**. Thank you very much, Mr. Hall.

[The prepared statement of Mr. Hall follows:]

Testimony of the Land Preservation Association before the United States Senate Committee on Energy and Natural Resources Subcommittee on Water and Power

Introduction

Land Preservation Association is an association of water agencies that collectively serve over one million acres of agricultural lands and wetlands on the west side of the San Joaquin Valley in central California. These districts are in the San Luis and Delta-Mendota units of the U.S. Bureau of Reclamation's Central Valley Project. The area they serve is one of the world's richest agricultural areas, but its future is in jeopardy because of inadequate facilities and methods to properly manage saline, subsurface agricultural drainage water. On the west side of the San Joaquin Valley, more than one-half million acres of fertile, highly productive farmland, including portions of 5 of the nation's top 10 agricultural counties, will be impacted unless an economically feasible and environmentally acceptable solution to these problems is developed and implemented.

If the problems are not resolved, much of this land eventually will be forced out of production with direct losses in gross agricultural income of $500 million and total economic losses of at least $1.5 billion to the State and nation. These losses would impact not only the farmers and their employees, but many related supply, service, transportation and marketing businesses throughout California and the nation, as well as tax revenues at the local, State and federal levels.

Drainage problems are not unique to the San Joaquin Valley; they have plagued irrigated agriculture throughout history and continue to present serious problems in many countries around the world. Ancient civilizations either did not have the technology to solve their drainage problems or they were not aware of the benefits of draining the land. Today, technology is available to drain farm land and has been successfully implemented in several regions of California, as well as other agricultural areas of the western United States. The continuing problem is one of managing the drainage water those on-farm drainage systems produce.

Presented by Stephen K. Hall, Land Preservation Association Executive Director, at Sacramento, CA on August 29, 1989

Drainage Solution Requirements

Since the problems at Kesterson Reservoir first came to light, local water districts have taken a leading role in solving the complex problems of managing drainage water. The experience those districts have gained over the past several years has shown that the nature and severity of the problem varies from region to region within the valley. Because of that, the mix of management options used in each area will likely vary. However there will be some consistent requirements that will have to met by all regions and by any mix of options that are chosen.

* **Land Preservation** - Ultimately, the need for drainage stems from the need to keep land unsaturated and free of salt build-up. Any option that fails in either of these respects will not work in the long run.

* **Environmental Protection** - The land cannot be preserved by sacrificing water quality or other elements of the valley's environment. Objective standards have to be set and met to protect public health as well as wildlife and other beneficial uses of water.

* **In-Valley Disposal** - Virtually every scientific study of the valley's drainage problem has concluded that a drain to the ocean would be the most effective solution, environmentally as well as economically. Nevertheless, events over the past several years have so raised concerns in coastal communities that any plans to build an ocean outfall for valley drainage water should be postponed until we are convinced that a drain to the ocean is 1) the best overall solution; 2) can be operated with no significant impacts to the receiving water; and, 3) that all reasonable measures have been taken to manage valley drainage water in the valley.

* **Affordability** - The costs of drainage management will undoubtedly be shared. Where benefits accrue to project participants, they should bear the cost of providing those benefits. Where there are broad public benefits, those costs should be borne by the government. But regardless of how the costs are shared, they cannot be unreasonably high. Unlike other industries, farmers can't pass along increases in costs. The federal treasury has its limits as well. Both the project participants and the public will benefit from sound drainage management. Both have a stake in seeing that it is affordable.

Drainage Solution Components

Work by local water agencies has shown that drainage management options, particularly those implemented on the west side, will include the following elements:

* **Water conservation** - it is known that the volume of drainage water collected from a farm field is dependant, though not exclusively, on the amount of irrigation water applied to that field. To the extent less water can be applied through irrigation, the volume of drainage water can be reduced, thus making the problem easier to manage.

Local water agencies have been very aggressive in promoting on-farm water conservation to reduce the drainage problem. District activities include:

DISTRICT	ACTIVITY
Broadview Water District/Pacheco Water District	Tiered Water Pricing
Central California Irrigation Dist.	Low Cost Loans for Water Conservation Improvements
Westlands Water District	Irrigation Management Grants
All Districts	Water Conservation Programs

It should be made clear that irrigators in the San Luis Unit are already among the most efficient in the country. Their water entitlement from the Central Valley Project is barely adequate and they make the maximum use of the water they receive. Nonetheless, they recognize that by making incremental improvements in their irrigation efficiencies, they can help manage drainage problems in a cost effective way.

* **Drainage water treatment** - Some form of drainage water treatment to remove or at least neutralize potentially harmful constituents such as selenium may be necessary in parts of the valley, including the San Luis Unit. Local districts have researched a number of methods for treating their drainage in some manner. Those research activities include:

DISTRICT	ACTIVITY
Westlands Water District	Biological Treatment Cogeneration
Panoche Drainage District, Other Districts	Iron Absorption
Firebaugh Canal, Other Districts	Cogeneration

In all, these districts have spent over $5 million researching treatment methods. In addition, Westlands Water District is participating with Fresno State University, the State Department of Water Resources and other agencies in developing a research station to further investigate drainage water treatment and other drainage water management options.

* **Drainage Water Reuse** - Though subsurface drainage water is too salty to be reused for most other purposes, there is some potential for reusing or recycling this water. Broadview Water District, for instance, recirculated its drainage water for many years through the 1960s and 1970s. Broadview has discontinued the practice because it recognized that on a long term basis, recycling the salts in the drainage water would lead to the continuing decline in productivity and in the selection of crops that could be grown. During the period Broadview Water District recirculated, crop selection deteriorated from vegetables and melons to cotton and grain crops. Since discontinuing the practice, farmers in Broadview Water District have once again been able to grow those higher value crops.

A more promising reuse possibility is agroforestry, involving use of drainage water to irrigate eucalyptus and other extremely salt tolerant plants that could then be harvested for fuel or for other purposes. At least two experimental plots are underway on the property of western San Joaquin Valley growers to determine the viability of this reuse possibility.

A third possibility involves pumping of water from deep within the shallow groundwater table. The water at that level contains virtually no selenium and is much lower in dissolved salts. This water could be used for irrigation, but a more viable option appears to be using the water as an additional supply for local wetlands. Wetland vegetation is more salt tolerant and badly needs the additional water such a pumping plan would provide. Local districts have already carried out some preliminary research on this possibility in conjunction with the U.S. Geological Survey and have asked the USBR, as well as USGS, to conduct further research.

* **Salt Disposal** - No matter what drainage management options are implemented, they will have to include some means of isolating the salts in the drainage water so that they do not contaminate the valley's soil or water resources. Over one million tons of salt are imported to the LPA service area each year through the irrigation water that is brought in from the Central Valley Project. That salt load in addition to the salt already in the soil profile of the valley's soils must eventually be balanced by an equal amount of salt being exported or the valley will

salinize and become a desert. Although the presence of trace elements in the drainage water is troubling and their impacts on water quality and wildlife are potentially dramatic, the basic problem is one of achieving salt balance in the valley. Accordingly, salt disposal must be the end result of whatever options are chosen.

For lands in the Grasslands area, including some San Luis Unit districts, discharge of salts to the San Joaquin River may be at least an interim option. Those districts are now discharging drainage water to the river under preliminary water quality objectives set by the Central Valley Regional Water Quality Control Board. Nevertheless, there are limits on the amount of drainage water that can be discharged and more land needs to be drained than can discharge to the river under present conditions. South of the Grasslands, in Westlands Water District, there is no outlet to the San Joaquin River or elsewhere. That district will have to dispose locally of the salts accumulating in its lands. In addition to water treatment to remove salts and/or trace elements Westlands Water District has developed a pilot deep well injection program to dispose of saline drainage water. That project, in combination with other management techniques will dispose of a portion of the saline drainage water generated within the district, but is not expected to fully meet the district's salt disposal needs.

Evaporation basins have been used in other areas in the south San Joaquin Valley, however, those now appear to be exhibiting Kesterson-like symptoms in some areas and their future appears uncertain. Evaporation basins will likely continue to be a part of the mix of drainage management techniques used but will have to be constructed and operated differently than they have been in the past.

Whatever salt disposal option is chosen, as long as ocean disposal is postponed, storage of salt in the valley will be a continuing management problem.

USBR's Historic Role In Drainage

Before the Bureau of Reclamation (USBR) even began delivering water to the western San Joaquin Valley, it was well known that the area would have to be drained to remain productive. As a result, USBR committed to build a drainage collection and disposal system to serve the area receiving federal water. The San Luis Drain, Kesterson Reservoir and a partial collector system in Westlands Water District were the first phases of a system intended to convey farm drainage to the ocean, where it could be safely disposed.

The events at Kesterson Reservoir interrupted plans for drainage water disposal in the ocean, but they by no means ended the federal government's legal or moral commitment to provide drainage service to lands in the San Luis Unit or protection from groundwater to lands downslope. The farm land and wetlands in this area are a valuable national resource. Water service through the Central Valley Project has enhanced that resource. Providing adequate drainage is simply a necessary part of preserving and maintaining those land and water resources that have been developed. The fact that the drainage initially developed has not succeeded does not lessen the need, nor should it lessen the commitment to provide drainage service to these irrigated lands.

USBR's Current Role in Drainage

As a result of the events at Kesterson Reservoir, USBR joined with the U.S. Fish and Wildlife Service, U.S. Geological Survey, California State Department of Water Resources and California Department of Fish and Game in a state-federal study effort known as the San Joaquin Valley Drainage Program (SJVDP). The Bureau discontinued any formal drainage planning outside the SJVDP; so, since 1984, virtually all formal planning by the federal government on drainage for the western San Joaquin Valley has been through the SJVDP. The only other drainage work the Bureau has done in this area has been in efforts to close and clean up Kesterson Reservoir.

The SJVDP will conclude its efforts in October, 1990. The program will have expended approximately $50 million and will have produced a number of technical reports on various aspects of the drainage problem. Although some of the information developed by the drainage program will be useful in developing solutions, much of the work has been devoted to developing basic information on groundwater hydrology and aquatic biology. This work will have broad public benefit since it has contributed to our knowledge about the behavior of trace elements in the environment and may contribute some general drainage management concepts. However, the SJVDP will not provide the sort of detailed information necessary to authorize a project or proceed with detailed planning. Nevertheless, under the current USBR policy the costs of the SJVDP are being billed to the San Luis Unit of the Central Valley Project. Allocation of those costs in this manner is clearly inappropriate and that cost allocation should be revised.

A similar problem is the allocation of costs associated with the closure and clean up of Kesterson Reservoir. At no point were water districts in the San Luis Unit or the growers served by those districts involved in the planning, design, construction or operation of Kesteron Reservoir. They were certainly not involved in the decision to convert Kesterson Reservoir into a wildlife refuge, an action that was to become one of the single largest contributing actions to the events leading to the closure of the reservoir. Any nominal benefit received by those lands that were served by Kesterson Reservoir during the limited time it remained open was more than offset by the tremendous economic hardship imposed by its sudden closure. Despite that, current USBR policy calls for the San Luis Unit lands to bear the cost of closure and clean up of Kesterson Reservoir, though the vast majority of those lands never received any benefit at all from the reservoir's operation. That policy needs to be changed.

The Citizens Advisory Committee, made up of interests from the valley as well as the bay area and from major environmental organizations in the state have an ongoing advisory role to the the policy and management committee of the SJVDP. That committee took under advisement the matter of repayment of costs for Kesterson clean up and closure, as well as repayment of costs associated with the SJVDP. It was the unanimous position of the Citizens Advisory Committee that only those costs of the SJVDP directly related to solutions implemented in the San Luis Unit of the Central Valley Project should be borne by the project participants. Furthermore it was the committee's unanimous conclusion that no significant share of the costs associated with closure and clean up of Kesterson Reservoir be borne by the project participants.

It remains to be seen how USBR will meet its commitment to drainage service once the SJVDP has concluded its work. Local interests expect and hope that the bureau will meet its commitment to provide drainage service to the lands in the San Luis Unit. The agreement reached by the Department of the Interior and Westlands Water District regarding drainage service will hopefully become a pattern or a blue print for all of the land within the San Luis Unit. The bureau will also need to recognize the need for an adequate long term water supply for local wetlands and should provide adequate protection for farm lands downslope from the San Luis Unit.

USBR's Future Role in Drainage

Beyond meeting its immediate obligations, LPA and its members encourage USBR to take an active long term role in drainage issues. Drainage management is a good example of the kinds of issues USBR will be facing in the future, as it embarks on its new mission. Drainage is a direct outgrowth of water development, and drainage management is just part of maintaining a developed water resources system. As such, it is a problem that can not be merely solved once and forever. As long as the western San Joaquin Valley is irrigated it will have to be drained, and drainage water that is produced will have to be managed in some way.

In fact, we believe the key to USBR's success in its new mission will be in how well it does in helping to solve problems such as drainage that arise once a system like the Central Valley Project is in place and operating.

In approaching these challenges, LPA believes USBR should not just be doing new things, but should be doing things in a new way. USBR has already taken several commendable steps to balance its management of the CVP so that the valley's environment is preserved and enhanced as well as the valley's economy. Those steps indicate a sensitivity toward changing values and an enlightened sense of responsibility in managing the state's resources. We would like to see USBR continue to move in that direction and believe there are several areas in the drainage issue where that can be done.

Perhaps most important is for USBR to act on the fact that no single large project will solve the valley's drainage problems in the near term. There are at least three areas within the LPA service area, for instance, that have distinctly different drainage situations. Each area will probably require different management to overcome its drainage problems. It is quite possible that the problem will have to be approached district by district in order to arrive at the best mix of solutions.

That will require USBR to take more of a partnership role with individual and small groups of districts in the service area. If that is done, the management options that are implemented will have a much more local influence. As a result, they will be more responsive to local needs and will probably be more cost effective. LPA beleves that active local district participation in planning drainage options will result in plans that have support at all levels and will be more likely to receive congressional support.

Such an approach by USBR will be more likely to achieve consensus, but it may require the bureau to alter the makeup of its work force, relying less on engineering and more on professional planning, economics and biology. The core of USBR has always been sound engineering, and it should remain so; however as USBR becomes less a builder and more a manager it should bring in expertise to keep it a competent manager, particularly in an era that demands such careful management of a scarce resource.

USBR Involvement in Local Solutions

In partnering with local agencies on drainage solutions, USBR can play a particularly valuable role in a few key areas:

* **Water conservation** - Much progress has been made at the local level in adopting on-farm water conservation but districts need ongoing technical and financial assistance to maximize the

effectiveness of this effort.

* **Drainage water treatment** - The engineering and research capabilities of USBR would be of great help to local districts, which have neither the technical nor the financial resources to conduct ongoing water treatment research.

* **Drainage water reuse** - The Bureau, as well as U.S. Fish and Wildlife Service and U.S. Geological Survey can be helpful in developing reuse potential, particularly in such areas as groundwater pumping.

* **Salt disposal** - management of the volumes of salt that will be generated in the Valley is both an engineering and environmental problem. USBR can play a valuable role in helping districts manage the volume and timing of salt discharge to surface and groundwaters so as to minimize environmental impacts.

Potential USBR Projects

There are specific projects that local districts are pursuing to better manage their drainage water where USBR could be of immediate help:

* **Groundwater pumping** - work by the U.S. Geological Survey indicates that pumping groundwater from drainage problem areas could lower the overall water table and reduce the volume of poor quality water discharged from farm drains. In addition to reducing the drainage problem, the water could be used in local wetlands, providing a much needed source of water. Local districts have initiated work on a project to test that theory but need financial and technical assistance to carry it out. USBR has technical expertise and equipment to assist in this effort, and could help further develop groundwater pumping in the area if it proves to be viable.

* **Use of the San Luis Drain** - Districts in the grasslands area have historically discharged drainage water through the local wetlands. Since the discovery of selenium in the drainage water and its effects on wildlife, there has been concern about the continued use of channels in the wetlands to convey that drainage water. Those districts discharging the drainage water have developed a plan to use the San Luis Drain to convey their drainage water around the wetlands, enabling them to better manage their water and providing a number of environmental benefits to the wetlands. USBR could be very helpful in developing this project and in allowing use of the drain.

* **District Drainage Plans** - Every district in the LPA service area is faced with developing a plan to manage its drainage water. Those districts in the grasslands area must develop a plan as a condition of discharging to the San Joaquin River.

Westlands Water District needs to develop a plan to complete drainage service to the lands it serves to keep that land in production. USBR should be working closely with all of these districts in developing those plans.

* **Cogeneration** - There are a number of water treatment options that have been explored, but one that shows particular promise is cogeneration, whereby natural gas is burned to generate electricity and the latent heat is used to desalt drainge water. The result is clean power and fresh water. Several local districts have investigated the possibility of using cogeneration to help dispose of there drainage water. USBR is very familiar with the technology involved in this process and could be very helpful to the districts in ascertaining the potential of that treatment process.

Beyond these specific steps, the bureau should review its current policy on drainage cost repayment in a timely way and modify its repayment policy on SJVDP study costs and Kesterson clean up so that project participants pay only for those SJVDP studies that are of direct benefit to them and that the federal government bears the cost of Kesterson clean up. If such a policy change requires congressional action, legislation should be requested by the bureau through the Department of the Interior.

These actions alone will by no means solve the serious drainage problems confronting the San Joaquin Valley, however, they represent a good start on a long term drainage management plan that is fiscally prudent and environmentally sound. Furthermore, it will demonstrate good faith by the federal government that it intends to honor its long term commitments to those districts in the San Luis Unit as well as to the wetlands, and farm lands downslope.

Conclusion

If the challenge of drainage water management can be successfully met, the bureau will be well on its way to fullfilling a new and even more productive role within the federal government in serving the needs of the nation and its citizens. LPA and its members strongly believe that the drainage problem can be successfully managed; however, as we have pointed out, a new approach is called for by everyone involved. We believe USBR can use the drainage problem as a beginning point in a new era where USBR develops a close partnership with local interests in both the water development and environmental communities and works towards building consensus among those interests. To do that USBR will have to build on its existing strengths and develop new ones with a long term goal of sustaining the finest water resource system in the world.

We at the local level are eager to begin a new partnership with USBR and the other agencies of the Department of the Interior and are ready to accept our full share of responsibility as stewards of land and water resources in our area. We appreciate the committee's interest in important water resource issues facing California and look forward to working with this and other committees of congress as it seeks to guide and counsel with USBR and the other Department of the Interior agencies in their evolving mission.

LPA thanks the chairman and the subcommittee for this opportunity to share our views.

Senator **Bradley**. Mr. Jerald Butchert of the Westlands Water District.

STATEMENT OF JERALD R. BUTCHERT, GENERAL MANAGER, WESTLANDS WATER DISTRICT

Mr. **Butchert**. Thank you, Senator Bradley, welcome to California. Congressman Fazio, it's nice to see you again. I have a statement, sir, I've submitted for the record.

Senator **Bradley** All statements that are submitted will be recorded in the record in full.

Mr. **Butchert**. Thank you. I've been asked to focus on what Westlands has been doing regarding drainage projects. But prior to that, I'd like to comment on a couple of things that have been mentioned. First about the San Joaquin River restoration project that has been mentioned here. Steve Hall and I sit on a committee organized by the Chamber of Commerce in Fresno, it's the San Joaquin River Parkway Committee, and the proposal is to create a 35-mile river park along the San Joaquin River from Friant Dam to the Seguro Dam downstream about 35 miles.

And I think that this whole concept of the restoration program, personally is an idea whose time has come. I think you should know that there's a great amount of enthusiasm for this parkway proposal in the Fresno area, amongst the business community. And I even detect a fair amount of enthusiasm among some of the farmers. And locally, in my district and in others, who think it is time to do something to bring that river back to some semblance of what it used to be years and years ago.

So I just want you to know that there's not a lot of negativism out there, there is I think a fair amount of positive thinking going on.

Steve and I are on a little subcommittee that is seeking more ways of getting water down the river, because one of the keys to having a nice river parkway is to have an adequate pool of water to enhance both the cold water fishery and it will enhance the recreational values.

Secondly, the Westlands Intertie has been mentioned a couple of times. I want to make a couple of clarifying points on that. The real name of the project is the Water Replacement Project. We're attempting only to construct a facility that will allow us to get water that we've been getting for the past 12 years or so, but due to two things, the drought and the coming on line of the San Felipe Project, a fair amount of our water supply has dried up. And we have one-third of our District, 200,000 acres of land that is getting only a net allocation of 1.3 acre feet per acre. And we're seeking to recover that and replace it with this facility.

Secondly, at the outset, we tried to encourage some environmental actions in connection with this, and we sought environmental groups' input, to help us figure out ways in which we could make this acceptable to the environmental community. We have met with a certain amount of success, I think we have some enthusiasm from the Department of Fish and Game, and from some of the waterfowl people, because there is capacity in the intertie to make water available for the Grasslands duck habitat, and at the end of the duck season, that water then could go into the San Joaquin River to help the downstream migration of salmon smolts.

So there could be some wins in connection with this intertie project as well.

Before going into the projects, I thought I might give you a little chronology. Jean talked about the Kesterson situation in 1983 and 1984. In January of 1985, the State Water Resources Control Board issued a cleanup order on Kesterson. In March of 1985, Secretary Hodel issued a decision closing Kesterson and also said, the way to do that is, we're going to shut the irrigation water in 42,000 acres in Westlands. This caused a great amount of panic, as you might well imagine, to the farmers in that area.

And so we had some very hectic negotiations in Washington, and in April of 1985, negotiated an agreement with Interior whereby we agreed that Kesterson should be shut down, and the drainage water should stop flowing to Kesterson. And in exchange for that, Secretary Hodel agreed to keep the water supply flowing.

We immediately undertook to do projects that would be a substitute for Kesterson, to try to come up with ways in which we could take that water and do something with it. In the final analysis, we couldn't find anything that was economically possible to do or environmentally possible to do, so we wound up doing what the agreement called for, and that is, we plugged the drains. We spent our own money and plugged the drains, so that no drainage water flowed out of Westlands Water District into the drain or into Kesterson after June of 1986.

In December of 1986, we reached agreement with the United States on a massive piece of litigation that we were involved in, covering a number of years. And the two things that are relevant here in that litigation which was ordered, the judgment issues in a Federal District court, were Westlands' obligation and U.S. obligation relative to drainage.

Our obligations were to collect and put into a trust fund $5million a year, accumulating $100 million, which would be up-front money, financing, on a cost-sharing basis with the United States, for drainage facilities, once these were identified. The U.S. obligations are, A, they're supposed to develop a drainage plan to take and dispose of 60,000 to 100,000 acre feet of drainage water. That plan is supposed to be completed in December of 1991. If Congressional authorization is needed, they are to seek Congressional authorization by December of 1993. And assuming the project is reauthorized, funds are to be committed to it in 1996.

I would note that, kind of following up Steve's remark, the Bureau and we have started the joint planning for this drainage plan. We started in August, a month ago, and we had a meeting two weeks ago, and we have another one next month. The program has started the joint planning effort, including the Bureau of Reclamation and ourselves.

From 1986 to 1991 is 5 years. And our farmers could not wait to get something going. The reason is that there was almost a panic situation created out there. And the lenders were very, very nervous about lending money to farmers for crop loans and that sort of thing, with this threat of a drainage problem unresolved. And so Westlands felt kind of duty bound to jump in and start doing things. And we did, immediately after we reached the agreement with the United States.

The first thing we did was an expanded water conservation program. In conjunction with the State of California, a coterminus west side resource conservation district, ourselves, we cost-share with growers to hire program consultants to help them use less water, and reduce the amount of water that seeps into the underground and causes the drainage problem.

Altogether, this program involves expenditure between Westlands, State, RCD money, farmer money, something on the order of $600,000 or $700,000 a year. It's not a small program, and an expansion of a program that we've had in place since about 1975, which includes our water conservation and management staff, and our engineering staff.

The second thing we tried was a biologic selenium plant. A company in England, Binnie, Inc., a worldwide engineering firm, came up with a proposal to build kind of the functional equivalent of a sewage treatment plant, but it focused on removing selenium. And what they discovered was a bug, a bacteria, that fundamentally ate selenium. And the plan was to put this bug into the water and let them eat the selenium and then filter the bugs out and dry them out, and then you would have it all concentrated.

We funded that program for about two and a half years, and we spent about 2½ million dollars in doing so. We terminated the project in 1988, because they were unable to get the selenium levels down low enough to meet the technical standards we had set, which were ten parts per billion. And so we kind of put that project on the back shelf, because it was working, but it wasn't working good enough, and we felt there were other things we needed to try.

By the way, we eliminated, throughout this whole process, probably 100 or 150 various black boxes and, you know, neat patents and pie in the sky and all this kind of stuff where people have come in, charlatans and salesmen and everything, and when we got rid of a lot of underbrush, and I think we kind of focused on some things that may be workable.

The third thing we did, and we just completed construction, is a deep injection well, a technique that is being used in the oil industry in California for about 50 years, taking salty water, injecting it down underground in the deep zones. The well was completed, drilled about a month and a half ago, to a depth of about 8,000 feet. We'll be injecting at about the 7,000 foot level into sands which we believe will accept water. These sands are located 5,000 feet below the fresh water zone, and we'll be injecting water into salt water down there, chromate salt water, which is about twice as salty as seawater. So in a sense we might be improving the quality of that water.

We expect to start testing in about next March, we're going to put pumps on these deep wells, and we have to do some other things, but it's on its way.

Steve mentioned the shallow groundwater pumping, and we have engaged a firm called Geomatrix to do mapping of the underground hydrogeology, we have drill rigs out digging holes in the ground and taking core samples and one thing and other. We think that this has a lot of promise, we've been working with USGS, and we think it's an idea that our board feels constrained to go ahead and do some more work on.

Next, trees. There is a fair amount of enthusiasm for growing salt tar eucalyptus trees, and using drainage water to irrigate these trees. When you stop and think about it, trees are a great evaporator of water, through the rapid transporation process. An acre can evaporate as much water as an acre of water, an acre of pond, but they're more environmentally benign, because they're not an attraction for waterfowl, where the selenium might accumulate.

So there are a lot of folks out there that think that trees are a good option for reducing the quantity of drainage water through evaporation.

Finally, Steve mentioned cogeneration. This is a process whereby we could use gas-fired turbines, which are off-the-shelf products, instead of wasting the heat left over through evaporation to the atmosphere, the heat would go to desalt the drainage water. So that in the process, you would wind up with fresh water, desalted water, and dry salt.

And we spent about $200,000 so far investigating that process. And we think, for known engineering technology, it's one of the few things that are out there that could, if the economics work out, manage drainage water, so that you produce some saleable products, electricity on the one hand and fresh water, fresh desalted water on the other hand.

And finally, the research facility. We've been working with Cal State University, Fresno, engineering department, and the State of California, DWR, and we have dedicated some of that land that we purchased out there for a research facility which would be managed by the University. There would be a technical peer review committee that would look at research projects proposed by different individuals and college folks, and we would let them go out there and play with the real stuff. It wouldn't be a matter of constructing some drainwater in a laboratory back in Baltimore or something.

Altogether, we've spent so far about $7 million, and I think that our commitment to continue, particularly to continue cooperating with the Bureau of Reclamation is there, and for our own people's sake, we want to see this problem solved.

Thank you, Senator.

Senator **Bradley**. Thank you very much, Mr. Butchert.

[The prepared statement of Mr. Butchert follows:]

The Statement of
Jerald R. Butchert, General Manager of
Westlands Water District
Presented to the
Senate Subcommittee on Water and Power
August 29, 1989

District Background/History

Westlands Water District (Westlands or the District) was formed in 1952 under provisions of the California Water District Law upon petition of landowners, many of whom were also farmers in the area, within Westlands' boundaries. Westlands' formation was a necessary step in order to establish a contracting entity for a surface supply of irrigation water for the farmers. In developing the area, farmers had relied upon pumped water from underground aquifers, which were being severely overdrafted.

For the principal purpose of furnishing water for irrigation, the Secretary of Interior (Secretary) was authorized under the San Luis Act of June 3, 1960, to construct, operate and maintain the San Luis Unit as an integral part of the Central Valley Project. The San Luis Unit would also provide water for municipal and domestic purposes, as well as recreation and fish and wildlife benefits.

Agricultural drainage service also was provided for in the San Luis Act. Thus, Section 1(a) of the Act states, in part, that:

> Construction of the San Luis Unit shall not be commenced until the Secretary has...received satisfactory assurance from the State of California that it will make provision for a master drainage outlet and disposal channel for the San Joaquin Valley, as generally outlined in the California water plan, Bulletin Numbered 3, of the California Department of Water Resources, which will adequately serve, by connection therewith, the drainage system for the San Luis unit or has made provision for constructing the San Luis interceptor drain to the delta designed to meet the drainage requirements of the San Luis unit as generally outlined in the report of the Department of the Interior, entitled "San Luis

Unit, Central Valley Project," dated December 17, 1956.

Westlands' Water Supply

In 1963 Westlands entered into a long-term water service contract with the U.S. Department of the Interior's Bureau of Reclamation (Bureau). The contract provided for surface water delivery from the San Luis Unit of the Central Valley Project over a period of 40 years from the date of the initial water delivery to the unit, which happened to have occurred in 1968. The contract provides for both water and drainage service, and was the traditional water service contract that the Bureau was signing for other water entities at that time.

The 1963 contract provides for 900,000 acre-feet of water annually for Westlands, which at that time consisted of about 400,000 acres. In 1965, at the insistence of the United States, Westlands merged with the adjacent Westplains Water Storage District, which contained some 200,000 acres, but had not contracted for a water supply. At that time, the United States committed the remaining yield of the San Luis Unit, some 250,000 acre-feet annually, to provide a water supply for the added acreage. It was recognized by both the United States and the farmers and landowners that 250,000 acre-feet was insufficient for the needs of the additional acreage. However, the 1963 contract provided for the purchase by Westlands of additional (interim) water, if and when available.

The merger was accomplished by passage of a special statute by the California Legislature. A basic provision of that statute assured the lands in the original Westlands district a prior right to water under any contract in effect for that District, namely, the 1963 contract. This supply provides about 2.6 acre-feet per acre to the 338,323 acres currently eligible to receive project water in this area of the District, an adequate but not abundant supply for the present cropping pattern.

However, the 250,000 acre-feet for the former Westplains area provides only half that much, 1.3 acre-feet for each of the 187,551 eligible acres, a clearly inadequate supply. Until the San Felipe Project came on line, however, an additional 100,000 to 150,000 acre-feet of interim water has been available in most years to meet the needs of the farmers in the former Westplains area.

Acreage Limitation

Prior to the first significant deliveries of San Luis Unit water to Westlands in 1968, much of the land was held in large ownerships. Only about 129,000 acres were held in ownerships of 160 acres or less and were immediately eligible for project water. However, as distribution facilities were completed and Project water became available, most of the owners who held land in excess of 160 acres entered into recordable contracts. Those contracts, which are a condition to receiving Project water for excess land, require that the landowner agree to sell his land within 10 years (five years under the new law) at a Bureau-approved price which does not include any increment of value attributable to the availability of Project water and to persons who will be non-excess landowners.

By the mid-1970s, more than 350,000 acres had been placed under such contracts and nearly 135,000 acres had been sold at Bureau-approved prices to new owners in parcels of 160 acres or less. As a result, the numbers of both landowners and farms had more than doubled, from about 2,500 to nearly 5,300 and from 97 to about 220, respectively. The average size of the farming operations had been cut in half, from 4,640 acres to about 2,400. Two of the largest farms, Giffen, Inc., and Anderson, Clayton & Co., sold nearly 77,000 acres. This land was purchased by 607 individuals who operated 77 separate farms.

The sale of excess land was halted in 1976 by a Federal District court order, which required the Bureau of Reclamation to conduct such sales under formal rules and regulation in accordance with the Administrative Procedures Act, rather than under less formal guidelines and instructions. At the same time, there was increasing interest in Congress to modify the original Reclamation Act of 1902. Consequently, formal rules and regulations for the sale of excess land were not adopted until after passage of the Reclamation Reform Act of 1982.

Excess land sales resumed under formal rules and regulations in 1984. In the past five years, approximately 100,000 acres has been sold to new owners. Southern Pacific, for example, has sold some 70,000 acres. In addition, many of the existing larger farms were broken up in order to comply with the provisions of the Act.

Clearly, the social goals of breaking up large ownerships and widely distributing project benefits have been largely achieved in Westlands. Critics who claim that interest-free repayment of the capital costs of irrigation projects, such as the Central Valley Project, is an unwarranted subsidy overlook an important fact: In order to maximize the distribution of benefits derived from the expenditure of public funds, the United States Congress placed limits on the amount of land a person could own and irrigate with Project water. Currently there are 612 farms in Westlands which receive project water. These farms average 875 acres each.

Crop Production

In 1988, the farmers in Westlands produced crops with a gross farm-gate value of more than $650 million. This is equivalent to about one-third of the total agricultural production in Fresno County, which is the nation's leader in that respect. Some 35 crops are produced in Westlands, including cotton, tomatoes, lettuce, cantaloupes, almonds, garlic, onions, broccoli, carrots, and a variety of other vegetables. The acreage of all vegetables and melons has more than doubled since 1980, while the plantings of wheat and barley have sharply declined.

Drainage History/Background

Adequate drainage is necessary anywhere irrigated agriculture exists. Throughout the world, irrigated agriculture has resulted in salt buildup in the soil, particularly in arid or semi-arid areas. Irrigation water carries salts which accumulate in the soils, eventually retarding plant growth and lowering productivity if the salts are not removed. Leaching, the agricultural practice used to remedy salt buildup, is the application of water in excess of crop needs to carry salts below the crop root zone.

Salt accumulation is complicated in Westlands and other areas of the western San Joaquin Valley because of impermeable clay layers that lie beneath the soils. These clay layers make it virtually impossible for leaching flows to carry water away from the crop root zone, resulting in highly saline perched groundwater. Without adequate drainage, the perched water table rises into the crop root zone, posing a dangerous hazard.

Efforts to maintain economical agricultural operations in areas where salt accumulation is a problem has resulted in the practice of installing subsurface drains to collect and carry excess salty water away for disposal, or discharge to a salt sink.

In the 1960s, Westlands and several other water agencies, urged the Bureau to develop drainage facilities as required by the San Luis Act. From 1968 to 1975, 82 miles, or 40 percent of the Drain and 1,280 acres, or 21 percent of the Kesterson Regulating Reservoir were constructed. The Drain would have been a concrete-lined canal with capacity to carry approximately 150,000 acre-feet of drainage water per year from the San Luis Unit.

The Drain was designed to empty into the western Sacramento-San Joaquin Delta near Chipps Island. However, the Drain's construction was halted in 1975 because of funding limitations and disagreements over the potential environmental impacts of drainage water discharge into the Delta. An outlet was never constructed and Kesterson became the terminus of the Drain.

With the intent of increasing habitat for waterfowl in the San Joaquin Valley, the United States Fish and Wildlife Service (FWS) in cooperation with the Bureau in 1970 designated Kesterson Reservoir as a National Wildlife Refuge. The location of the refuge is situated along the Pacific Flyway. At the time of the designation, it was known that the only reliable permanent water supply for the refuge would be subsurface saline drainage water transported through the San Luis Drain.

The Bureau started construction of Westlands' drainage collector system on 42,000 acres in the northern part of the district in 1976. The system consists of about 108 miles of open-joint collector pipelines at 0.5-mile intervals. About 5,000 acres of grower-funded subsurface on-farm drainage systems were installed and connected to the collector system between 1978 and 1981. A moratorium on these on-farm drainage system hookups was imposed in May 1981 because of the limited capacity of Kesterson Reservoir. During 1980 the Bureau renewed technical studies that were needed to obtain a discharge permit from the California State Water Resources Control Board (SWRCB) for the

Drain to discharge into the Delta.

In 1983 FWS biologists discovered waterfowl deformities and deaths at Kesterson, which later were attributed to excessive amounts of selenium. In order to minimize waterfowl attraction to Kesterson, the Bureau reduced the number of ponds and provided additional water deliveries to neighboring wetlands. A hazing program was also started to discourage the waterfowl from nesting at Kesterson.

Selenium is a naturally-occurring trace element found in rocks and soils at numerous locations throughout the world. Relatively large quantities of the mineral are found in the alluvial fans of Panoche and Little Panoche Creek in western Fresno County, including the area of Westlands served by the collector drainage system. Selenium is a necessary dietary element for humans and other animals, but can cause chronic or acute toxic effects when taken in elevated amounts.

Certain vegetation can absorb and accumulate selenium. Selenium uptake in crops depends on several factors including plant species, soil type and chemical form of selenium present. A recent study conducted by the Cooperative Extension of the University of California, Publication 3330, concluded, however, that selenium levels are not a human health concern in the crops grown on the west side of the San Joaquin Valley, where the District is located. Animals (invertebrates and vertebrates) also accumulate selenium through plant and animal food sources, causing concern for waterfowl and shorebirds that ingest plant, animal and sediment materials.

Tests completed in 1984 determined that selenium poisoning was the probable cause of death for 12 coots and one grebe found at Kesterson. The hazing program continued in an effort to keep waterfowl from using Kesterson. It was concluded that the selenium at Kesterson came from the agricultural drainage water carried to the reservoir via the San Luis Drain.

As the year 1984 began, completion of the Drain beyond Kesterson was still considered to be the most viable solution to the agricultural drainage problem. However, the discovery of selenium's toxic effects on waterfowl led to much controversy over the potential dangers of selenium and, possibly, other naturally-occurring trace elements. The resulting uproar and national attention left in doubt the concept of completing the Drain.

State Water Resources Control Board Order No. WQ 85-1

A neighboring landowner petitioned the Regional Water Quality Control Board (RWQCB) in April 1984, to prohibit the discharge of waste water into Kesterson Reservoir until waste discharge requirements were set. The landowner also petitioned the RWQCB to levy a fine, issue a cease and desist order prohibiting the discharge of drainage water, and issue a cleanup and abatement order. The RWQCB refused to take the actions requested by the landowner; consequently, he appealed to the State Water Resources Control Board (SWRCB).

The SWRCB held a series of three hearings to evaluate the different aspects of the petition and issued Order No. WQ 85-1 on Feb. 5, 1985. The order stated that the issuance of a cleanup and abatement order to the USBR was appropriate, and gave the Bureau three years to implement the order. Selenium was designated as the substance of most concern in terms of the harmful constituents contained in the drainage effluent discharged into the Kesterson facility.

The Closure of Kesterson Reservoir

On March 15, 1985, a congressional hearing was held in Los Banos, California, to consider Interior's progress in carrying out the SWRCB cleanup and abatement order. Citing possible criminal violations under the federal Migratory Bird Treaty Act as a result of the waterfowl deaths at Kesterson, the Interior Department abruptly, and without prior warning, announced that it would immediately begin the process of closing Kesterson Reservoir and the San Luis Drain. Again with no prior warning, Carol Hallett, Special Assistant to Secretary of Interior Donald Hodel, also announced that the Bureau would terminate irrigation deliveries to the 42,000-acre area of Westlands served by the drainage collector system.

The April 3, 1985 Agreement

The adverse impact which the loss of irrigation water and the closure of the Drain would have on farming within Westlands was immediately recognized. The potential losses in farm land values and crop production were considered very substantial, and even more so when the investment in the District's distribution and drainage systems were added. The shut-down would have affected 51 water user families, many of whom had poured their entire life savings into their farms.

Recognizing the seriousness of the potential disaster, Secretary Hodel agreed to examine the possibility of continuing water deliveries to that portion of Westlands. After intense negotiations between Interior, Westlands, farmers' representatives, the governor of California and other concerned parties, an agreement was signed on April 3, 1985, ensuring that water deliveries to the 42,000-acre area of Westlands would continue.

The agreement also required that the District halt drainage water deliveries to Kesterson by June 30, 1986. At the insistence of Interior, Westlands was required to do this even if it meant plugging the collector drains.

When District involvement in the drainage problem began, the District hired an engineering consultant, CH2M-Hill, Inc., and an environmental consultant, Jones & Stokes Associates, of Sacramento. One of their first recommendations included the possibility of disposing of drainage water by irrigating salt-tolerant forage crops for an interim one-year period. Wildlife experts, however, noted that the forage would be a potential threat to waterfowl by the possible uptake of selenium in the grasses. This potential hazard forced Westlands to modify its plans to include the construction of storage basins and utilizing land application to handle drainage water produced during the fall and winter months. For the long-term Westlands planned to construct several evaporation ponds to dispose of up to 10,000 acre-feet of drainage water annually.

In August 1985, Westlands purchased 366 acres of a 3,500-acre site to be used for the evaporation ponds. The project site is located south of Adams Avenue and west of the San Luis Drain. Largely because of the supplemental environmental safeguards that were required for the storage basins, cost estimates for the project far exceeded original estimates. Westlands decided to scale back the proposed interim project to land application of drainage water on bare soil.

The 366-acre site was used for the land application of approximately 213 acre-feet of drainage water until November 1985, when land applications were discontinued because the soil profile had become saturated with the applied drainage water.

In September 1985, Westlands started a pilot water conservation and management program for farmers in the 42,000-acre area, recognizing that effective water conservation measures are key in any drainage water reduction program. Under the voluntary program, participating farmers received $8 per acre from Westlands to hire an irrigation consultant. Any fees exceeding the $8 per acre were paid by the farmers. During the 1985-86 season, about 94 percent of the land in the drainage service area participated in the program.

In 1986 Westlands approved a voluntary recycling program for the 42,000-acre drainage service area to provide an alternative for those water users who preferred to recycle their drainage water rather than have the collector drains serving their fields plugged. Program participants recycle the drainage water by blending it with "fresh" irrigation water and receive $25 for each acre-foot of drainage water recycled. The payment to water users is based on eliminating the expense of installing 104 earthen plugs.

For a variety of reasons, none of the alternatives examined were capable of meeting the June 30, 1986 deadline for terminating all drainage flows to Kesterson and Westlands was forced to plug the drainage collector system. Westlands began to immediately review a variety of other disposal alternatives including modification of the interim project, intensified irrigation water management, various treatment technologies and deep-well injection.

Barcellos Settlement

Further defining the roles of the Bureau and Westlands in terms of drainage obligation was the settlement of the **Barcellos** litigation in 1986. The Federal District Court judgment resolved key drainage issues. Among them was the definition of both Westlands' and the Bureau's roles in attempting to solve the drainage problem.

The **Barcellos** settlement obligates Interior's Bureau of Reclamation to develop a plan for agricultural drainage service by Dec. 31, 1991. This plan is to provide for drainage service facilities which are both cost-effective and financially feasible. The facilities must be able to transport, treat and dispose of 60,000 to 100,000 acre-feet of drainage water annually. The judgment also contains a schedule for the authorization (if needed), funding and construction of the drainage facilities by the United States.

If the Bureau does not produce a drainage service plan by the deadline set forth in the judgment, Westlands' can assert claims against the federal government based on commitments in the San Luis Act and the 1963 contract. The drainage service obligation that can be claimed against the federal government is limited to the removal and disposal of not to exceed 100,000 acre-feet of drainage water annually for the duration of the Judgment which expires Dec. 31, 2007.

In regard to Westlands' drainage obligations, the **Barcellos** settlement requires Westlands' landowners to place $5 million each year into a drainage trust fund until the fund totals $100 million. The trust fund money is to provide up-front cost-sharing for future drainage facilities. The cost-sharing payment is up to 35 percent of the estimated construction costs for drainage service facilities for that year. Westlands began collecting the amounts required by means of assessments on lands within the District's boundaries in 1988. Westlands is also required to pay its share of annual operation and maintenance costs for any drainage service facilities.

Other Westlands Drainage Projects

Not withstanding the obligation of the Bureau as provided for in both the San Luis Act and the **Barcellos** settlement, Westlands continued to pursue possible solutions to the agricultural drainage problem. Since the District started tracing the available alternatives, nearly $7 million has been expended on various drainage projects. That figure does not include any staff time or expenses in connection with the various projects.

Westlands/EDF Loan. Westlands and the Environmental Defense Fund (EDF) cooperated to jointly request a federal loan of $3.7 million, approved as part of the Energy and Water Development Appropriations Act of 1985, to conduct feasibility studies and prototype testing of the most promising technologies for solving the drainage problem. Interior never released the funds because of concerns over its authority to make such a loan. By July 1986, efforts to pursue the loan were dropped by Westlands when it was discovered that private borrowing was available at a lower interest rate.

Selenium Removal Plant. In 1986 Westlands decided to pursue a one-million-gallon-per-day version of a selenium removal plant that had been operating for 15 months on a smaller pilot scale. The process, developed by a British engineering firm, Binnie & Partners, had successfully removed up to 98 percent of the selenium in the farm's drainage water, as well as boron, which is toxic to many crops when concentrated. When the plant was modified to hold costs close to the original budget, the plant could not consistently succeed in reducing the drainage water selenium level to 10 parts per billion (ppb) or less. Because selenium levels of 10 ppb or less could not be reached unless extensive, costly changes were made to the plant, Westlands postponed indefinitely research on the selenium removal plant. From October 1986 through September 1988 Westlands expended more than $2 million on the selenium removal plant.

Deep-Well Injection Prototype. Also in 1986 Westlands decided to pursue a program involving deep-well injection of drainage water into the earth below a 5,000-7,000-foot-deep geologic formation. The drilling of the $3.6 million, 8,100-foot-deep prototype deep-well was completed on July 16, 1989 after a month of work by project consultant URS Corporation and its subcontractors. URS expects initial testing of the prototype, which is designed to inject one million gallons of drainage water each day, to begin in March 1990. Deep-well injection is viewed by the District as a potential method of disposing drainage water. To date, Westlands has spent about $1.5 million on the deep-well injection prototype.

Profitable Practices. Sharing proven water-saving ideas, whether practical or highly technical, is the focus of a new Westlands' publication, "Profitable Practices." This one-page water management fact sheet provides water users with new and workable water saving practices that are currently being used by fellow water users in Westlands. Farmers, in conjunction with District water conservation specialists, develop ideas for the publication with is published about every other month.

Water Conservation Program. In 1987 Westlands approved a $100,000 District-wide water conservation cost-sharing program similar to the pilot program established for water users in the 42,000-acre area. Participants are reimbursed $8 per acre to hire an approved irrigation consultant to evaluate current irrigation practices and advise farmers of possible improvements. Program participation has reached enrollment capacity each year since it started.

Microbial Treatment Process. In late 1987 Westlands provided $5,000 and office space at its Tranquillity Field Office for a University of California, Riverside pilot study to reduce selenium levels in evaporation pond sediments and drainage water. The process is a microbial treatment technique that encourages certain fungi to transform selenium into a relatively nontoxic gaseous form that dissipates harmlessly into the air. Although the process works by effectively eliminating selenium from the soil, the process is unable to rapidly accomplish major clean-ups, such as that required at Kesterson.

Ditch Seepage Loss/Geology and Hydrogeology of the Panoche Fan studies. Westlands expanded its drainage reduction efforts and authorized two studies. The first examined the extent of seepage losses from unlined, on-farm ditches and ponds as contributions to subsurface drainage; the second employed a variety of highly technical equipment to locate subsurface streambeds or sand stringers in selected areas of the Panoche Fan and to determine whether or not they are contributing to the drainage problem. Findings of the ditch seepage loss study, presented in December 1988, indicated that 27,000 acre-feet of water, or about 2.2 percent of the District's total water supply, was actually seeping from the unlined canals. The Panoche Fan study concentrated first on the upper 15 feet of the soil profile in the drainage service area. Lateral movement of groundwater was not found to be a significant cause of high water tables in the area. A second phase, which will attempt to identify upslope streams, began this year. Westlands spent nearly $20,000 on the ditch seepage loss study, and will spend at least $116,000 at the completion of the Panoche fan studies.

Selenium Removal/Cogeneration. Westlands began examining a cogeneration/evaporation system using natural gas to power turbines to produce electricity. The waste heat would be used to desalt drainage water.

Two firms were retained, URS Corporation and Resource Management International, and both concluded that cogeneration merited further investigation because revenue from the sale of electricity and water could offset some of the costs of the project, including its construction cost and the costs of handling the dry salts. Westlands contracted with RMI in April 1988 for a Selenium Removal Cogeneration Development Strategy. RMI's study indicated that the project did not, at least initially, have any fatal flaws. This project is looked at with a great deal of interest; it is the only one that currently offers any sort of return on investment by having a salable product to help offset costs. In addition, it reclaims salty drain water and reduces the salt disposal problem. To date, Westlands has expended $223,476.18 on the cogeneration/selenium removal project.

The Bureau's Role After SJVDP

As discussed elsewhere, the United States has a continuing obligation to provide drainage service to the San Luis Unit of the Central Valley Project, including Westlands. In a joint federal-state effort, the San Joaquin Valley Drainage Program was developed to study the drainage problem and make recommendations for possible solutions and/or alternatives for handling the subsurface agricultural water. The SJVDP has developed a great deal of necessary and useful information. However, it will not result in a drainage plan as required in the **Barcellos** judgment, and certainly will not fulfill the United States' obligation to provide drainage service as prescribed by the San Luis Authorization Act and the 1963 water service contract with Westlands.

We are pleased that the U. S. Bureau of Reclamation, in recognition of its obligation, has initiated a program within the Mid-Pacific Region to develop a drainage plan. That planning effort will be able to use a great deal of the information developed by the San Joaquin Valley Drainage Program, as well as the results of the numerous studies and prototype programs undertaken by Westlands and some other San Luis Unit districts.

Westlands will be working hand-in-hand with the Bureau in developing a drainage plan. We sincerely hope that the Congress will do everything within its power to provide adequate resources to allow the Bureau to complete this planning process in a timely, complete and professional manner.

As detailed elsewhere, the landowners in Westlands have been, and will continue to contribute $5 million per year until $100 million has been accumulated in a drainage trust fund for the District's 35 percent up-front financing of drainage facilities. We would urge that the Congress provide the additional federal funding to carry out its drainage obligation and implement the plan in a timely manner.

Implementing the Bureau's New Mission

You have asked us to respond to three related questions regarding the new mission of the Bureau in California, the opportunities for cooperation between environmental and water development interests and the Bureau's role in fostering such cooperation. The Bureau already has taken, and is taking a variety of steps to restore and enhance the fisheries and other environmental values in the rivers and streams within the Central Valley Project. As a contracting agency, Westlands applauds these efforts. The CVP should be managed in a way that protects and, ideally, improves fish, wildlife and environmental values, while protecting the financial integrity of the Project.

Another part of the Bureau's new mission is improved management of the system, as well as management of the water supply. This requires improved maintenance of the existing system, but also should include additions to or upgrading of existing facilities, so that already-developed water can be transported or conveyed to areas of need. The whole concept of water marketing cannot become a reality without adequate plumbing.

For example, a bottleneck now exists in moving water south of the Delta to meet the growing needs of the San Jose area, as well as the continuing needs of farmers in Westlands and other districts in the San Joaquin Valley. Specifically, the problem is a lack of capacity in the federal Delta-Mendota Canal to convey the full amount of water the Bureau is allowed to pump from the Delta under its permit from the State Water Resources Control Board. This conveyance problem has arisen since the San Felipe Project came on line two years ago.

Congress has already approved one solution to this problem as part of the Coordinated Operation Agreement legislation, which provides for the so-called Wheeling and Purchase agreement between the federal and state water agencies. In brief, this would allow the State Water Project facilities to be used to wheel Central Valley Project water and for Central Valley Project water to be sold to the State Water Project. Both the COA itself and the Wheeling and Purchase provision were broadly supported by both the water and environmental communities.

While negotiations have been underway for some time, it is obvious that final agreement still is several years away. When a satisfactory agreement is reached, we urge Congress to quickly approve that agreement, an action required by the COA legislation, in order to allow improved management of the two water systems.

In the meantime, and in view of the urgency of the need to alleviate this conveyance bottleneck, farmers in Westlands have made a commitment to pay about $5 million to install a link between the federal Delta-Mendota Canal and the State Aqueduct, which has adequate capacity to convey the additional water to users in the San Felipe or San Luis service areas. This short-term (five- to seven-years) intertie facility would be built at no expense to the federal government and turned over to the Bureau of Reclamation, thus adding to the operational flexibility and improving the management of the State and Federal water projects. If there is interim water available and it can be conveyed to the San Luis Unit without impairing the ability of the CVP to meet delta water quality standards, then and only then would the additional water be made available.

The additional operational flexibility may also provide some important environmental benefits. For example, the fisheries in the San Joaquin River system could be greatly improved if some water could be released from New Melones Reservoir on the Stanislaus River and/or Millerton Reservoir on the San Joaquin, then picked up in the Delta at the Tracy Pumping Plant and conveyed back to the contracting users through the Delta-Mendota Canal and California Aqueduct.

It should be noted that the Bureau already has initiated an effort aimed at finding ways to restore the San Joaquin River and thereby enhance the fisheries and other environmental values. A number of us in the water supply business believe there are opportunities to improve water conservation and management on the San Joaquin River in order to accomplish these goals. In initiating this program, the Bureau's Regional Director, Larry Hancock, has solicited the input and participation of the major environmental and water organizations.

Waterfowl habitat could be improved on the Pacific Flyway if water could be provided to the Grasslands area of western Merced County in the fall and winter through the Federal and State facilities. When released into the San Joaquin River in the spring, it helps downstream migration of salmon smolts. That water could then be picked up in the Delta and pumped back again to meet the summer needs of the CVP contractors, provided adequate pumping and conveyance capacity is available. We have suggested a modest version of such a program to leaders of the major environmental and wildfowl organizations in California in connection with our intertie project.

Let me emphasize, however, that whether we're talking about restoring environmental values or water marketing, the key to accomplishing these goals is having adequate conveyance and pumping facilities to move water from the area where it is available to the area it is needed. This may mean better conveyance facilities in and around the Delta, and more pumping and conveyance capacity to move the required volume of water during the often brief periods of time when it will not adversely affect environmental values. In this regard, the facilities proposed for the Mid-Valley Canal could be a real boon in accomplishing some of these goals.

It is simply a fact of life that whether we want to move water from one place to another for environmental purposes, for urban use or for irrigation, we simply have to have adequate plumbing. Anything the Congress could do to assist in expediting this needed plumbing would be a first step in furthering the new mission of the Bureau of Reclamation.

Senator **Bradley**. Let me ask all three of you to respond as close to yes or no as you can to a couple of questions. Do all of you agree that the San Joaquin Valley Drainage Program should be extended beyond 1991? Ms. Auer?

Ms. **Auer**. I think it probably will have to be in some form or another. I think there's a mixed opinion among us. Three of us serve on the Citizens Advisory Committee Together, Jerry and Steve and I. In what form, I don't know but as earlier testimony indicated, with Mr. Kennedy, the problem is not going to be over in October of 1990, and I think oversight hearings could help in determining what form a continued effort would be.

I think the Valley people honestly and understandably are worried about having to pay for a lot of this stuff that they may not feel particularly useful to them. So we do have to look at the repayment.

Senator **Bradley**. OK. Mr. Hall?

Mr. **Hall**. Well, I think what some of the program has done is, it's been very useful. I'm not sure that I would agree that it should continue as presently constituted, but clearly some additional planning is going to have to be done at the Federal, and probably at the State level as well. Whether that's given to one particular agency or not, I personally believe that we're now to the point that we've taken a lot of ideas that sound good, and sifted them a bit to the point where we can now—we've sifted a lot of them out, but I think it's going to take some very detailed planning from here on out.

I'm not sure that the drainage program as constituted is the right party to do that.

Senator **Bradley**. Mr. Butchert?

Mr. **Butchert**. Yes. I think——

Senator **Bradley**. You answered yes?

Mr. **Butchert**. Pardon me?

[Laughter.]

Senator **Bradley**. Did you say yes?

Mr. **Butchert**. Oh. Yes and no, I guess, is more proper. There's some things left unfinished, and I'm not sure who does them, but one of the things that I kind of grumbled about at the program folks is that there's still some research out there that needs to be done. We still don't know how to remove selenium and/or other toxic elements out of this water and isolate it, and make it manageable.

Somebody mentioned 3 million tons of salt coming into the Valley each day, that's about right. In the Westlands, on one cogen plant which processes 7500 acre feet of drainage water, we would produce 300 tons of salt a day. Now, we are going to engage a firm in Seattle who tells us that they think they know how to take selenium out of the water and out of the salt.

And that becomes very relevant, because if we don't, then you have to dispose of all that salt at a Class I hazardous waste site. If you can reduce the amount of selenium, reduce the amount of salt that has selenium in it to a smaller amount, then your disposal costs become more manageable and less expensive.

So I think there's a large area of research that, despite all of the things that we've done for the past four years, we still don't have good answers to.

Senator **Bradley**. Let me ask whether you all agree that the work to date with the program has provided valuable information.

Mr. **Hall**. Yes.

Mr. **Butchert**. I agree it has, because——

Senator **Bradley**. Do we have the same kind of information for the Tulare Basin?

Mr. **Hall**. Not to the same degree of detail.

Senator **Bradley**. Would it be advisable to get that information?

Mr. **Hall**. This is a personal view.

Senator **Bradley**. You're testifying as individuals.

Mr. **Hall**. Much of what has been researched and discovered through the Drainage Program are things that have broad public benefit. They will help us in understanding how trace elements behave in the environment, and groundwater hydrology things, general drainage concepts. I'm not yet sure, I wouldn't say it won't contribute substantially to drainage solutions, I'm not sure yet. I don't think the jury's in on that yet.

So I'm not sure if we duplicated in the State service area, whether it's in Tulare Lake or elsewhere, it would necessarily be a great investment of money.

Senator **Bradley**. So you're saying that what you'd like to do is figure out what you can do with the information from the San Joaquin Project, and then decide if it's worth getting the information on Tulare. Is that right?

Mr. **Hall**. Seems like a reasonable course.

Senator **Bradley**. So let me ask you this. Do you think there needs to be continuing groundwater monitoring in the San Joaquin Valley?

Mr. **Butchert**. I'll take a crack, yes, I do.

Senator **Bradley**. You do. Ms. Auer?

Ms. **Auer**. Absolutely.

Senator **Bradley**. Mr. Thomas?

Mr. **Thomas**. I agree.

Senator **Bradley**. That is done by the USGS. Do you think USGS has done a good job?

Mr. **Butchert**. In my opinion, USGS does a fine job. They're one of the more credible scientific governmental agencies out there.

Senator **Bradley**. Mr. Hall?

Mr. **Hall**. I think if there were a single agency that you could point to as having done an outstanding job in a scientific way, it would be USGS on the drainage program.

Senator **Bradley**. Ms. Auer?

Ms. **Auer**. I agree with that as well.

Senator **Bradley**. Mr. Thomas?

Mr. **Thomas**. I would concur.

Senator **Bradley**. In order to monitor groundwater, access to property is very important. You have to know whether the groundwater is there. What would you advise the Committee to do in the case of property owners who deny access to the USGS to monitor groundwater?

Mr. **Butchert**. I would have them delegate the monitoring authority to the local districts. We don't have any problem getting access in our district, and I've been associated with other irrigation districts in my prior careers, where we've done exactly the same thing. But the local districts, I think, have probably better cooperation from the farmers. It's not like a government man coming here and saying, I'm here to help you type of thing. It's a district man.

Senator **Bradley**. Mr. Hall?

Mr. **Hall**. I would agree. I think the districts will have much better luck, where neither USGS nor the districts can get on. The presumption, my presumption is, you're there to help them. We're here from the government, we're here to help. But if it helps solve the problem, then they ought to be willing to let you on.

And if you haven't convinced them that you can help them solve the problem, then there's some more work to be done there.

Ms. **Auer**. I would add that I think we need better groundwater management in California, not only in relationship to quality, but to managing, so we can have better conjunctive use programs, and protection.

Senator **Bradley**. Right.

Ms. **Auer**. We don't have that.

Senator **Bradley**. Maybe we need a stick as well as a carrot?

Ms. **Auer**. Right.

Senator **Bradley**. Mr. Butchert, do you agree?

Mr. **Butchert**. I'm not sure what the stick would be. [Laughter.]

Senator **Bradley**. Just a principle.

Mr. **Butchert**. Sticks work.

Senator **Bradley**. Mr. Hall, do you want to take that one, or do you want to

Mr. **Hall**. I'll refrain.

Senator **Bradley**. Let me ask you, and I'd like all four of you to give me your response. Do you think that the drainage problem can be solved by source control and invalley treatment, or do you think that we'll have to have the drain? Do you think it can be solved by source?

Mr. **Butchert**. In terms of salt management, no. Any student of history knows that there's never been an irrigated civilization in the history of mankind that has survived without coming into salt balance. So that the amount of salts brought into an irrigated area has to equal the amount of salts going out, and vice versa.

And so somewhere along the line will have to deal with that. Somebody has to deal with that. But I think we have time, and I think there are ways of managing the drainage problems in the Valley, for a good many years to come, without thinking about discharge to the ultimate sink, the ocean, or discharge to the Delta or something like that. I think we are committed to looking for those kinds of solutions. And I've told the Bureau that, in our first meetings, and I think we'll continue to go down that course.

Time, I'll quote the manager of the Drainage Program. Somebody asked him a question, well, how much time do we have? And he said 20 to 80 years. That's as good an answer as I've heard.

Senator **Bradley**. That's 20 to 80 years——

Mr. **Butchert**. Before you have to think about doing something about the salt balance.

Senator **Bradley**. Does everybody agree with that?

Mr. **Thomas**. I don't know that I can add very much. It's a technical question that you asked rather than an institutional one. In the view of the Program, I think all concur on this, the near term solution certainly should be in-valley solutions. If over the long run it's necessary to export salt, I don't know that that necessarily requires that there be a drain, as opposed to, for instance, a process to solidify the salt and truck it out.

Ms. AUER. There's a political consideration that we all acknowledge freely, and that is, whether we agree or disagree with this, that it's politically virtually impossible to consider an out-of-valley solution at this time. And that's a realism that's not technical, but it is political, and I think that that is why we are all looking at in-valley solutions, because that's really what we think is realistic to accomplish.

Mr. HALL. I would just agree and say that long-term salt balance is the issue, and we're going to have to find a home for that salt. But I think that those of us in the Valley recognize that at a minimum, we're going to have to do three things before we talk about exporting it anywhere. We're going to have to be sure that it's the best overall solution, that it's not going to significantly damage the receiving environment, and that we've done everything we can to manage it in the Valley before we even talk about it.

Senator BRADLEY. I'm going to yield to Congressman Fazio to ask a question or two if he'd like, but one last question before doing that. Are there any conditions under which evaporation ponds make sense, and as a part of the solution? And then I'd like Mr. Thomas to tell me why you said in your testimony that you felt that the ponds were in violation of the Migratory Bird Treaty. I'd like you to be specific.

Ms. AUER. Well, I'll give the Ed Imhoff answer as well, since Jerry took the liberty of quoting him, he's the project manager for the Drainage Program. We've discussed this at length, because evaporation ponds are very controversial as well.

And in the alternative plans, his statement is, you can have evaporation ponds, if they don't leak, if they are bird safe, and if they can't be made bird safe, then they must be made bird free. And in any case, you have to have receiving waters nearby, so that the birds are attracted to the refuge type situation.

And that's dealt with at some length in the alternative plan, which I submitted as part of my testimony, and you can peruse that at your leisure.

Mr. HALL. In my former life, I helped construct and manage a series of evaporation ponds in the south part of the Valley. And I believe that they can be a part of the ongoing solution, but I would agree with Ms. Auer about the conditions.

Senator BRADLEY. Mr. Thomas, on the birds?

Mr. THOMAS. Well, I was a little out on a limb with these birds, perhaps, in that I'm not the person at the Institute that has researched this particular area. But my general understanding is that we're dealing here with a treaty that obligates signatories to develop national laws and sanctions to prevent the kind of deformities and damages to migrating waterfowl that had occurred, for instance, in the Kesterson situation.

Senator BRADLEY. Now, tell me, what are the deformities?

Mr. THOMAS. I'm sorry?

Senator BRADLEY. What are the deformities?

Mr. THOMAS. You're talking about Kesterson?

Senator **Bradley**. Yes.

Mr. **Thomas**. Well, again, I'm probably not the person to——

Senator **Bradley**. Okay, maybe you could supply those two things to the record.

Mr. **Thomas**. Fine.

Mr. **Butchert**. Just one last comment, Senator. Our planning in Westlands is not to use evaporation ponds in any of the processes we get involved in. We think you're better off because of the environmental considerations and the birds' considerations, you're better off, if you can, to keep this stuff in a closed system, don't let it get exposed to the atmosphere.

Ms. **Auer**. One last note on that is that any alternatives I've been looking at in the plan, if it's used at all, it's vastly reduced. In other words, everyone's coming to realize that this is not a very good alternative, as was originally envisioned.

Senator **Bradley**. Congressman Fazio?

Mr. **Fazio**. Jean Auer asked the question earlier, who pays and how much. And as a member of the Appropriations Committee, I got fixed on that part. [Laughter.]

Mr. **Fazio**. We really don't know how much is going to be involved. Whether we're talking about Kesterson, or reclamation statewide, we have problems all over the western part of the country. These are very tough issues.

But from your own experience, could you give us what you think would be a fair way to allocate the costs of solving these problems. Who should pay and what share. And I think that might generate some controversy among some of you.

Ms. **Auer**. Well among my attachments is a document that the Citizens Advisory Committee unanimously adopted about a year and a half ago. And it outlines our theories on that, and I would commend it to your attention. I think that it's too long to go into today, but it says that we think the Kesterson should not be reimbursed, or be a nonreimbursable cost.

And that the other studies should be based on whether or not it has applicability to the users. And we haven't figured out what the ratio is, but we have a general formula that we suggested to the Secretary. And I have it as one of my attachments. It might be useful for you to review. Do you want to add anything to that?

Mr. **Hall**. Remarkably, Congressman, there is no controversy. Mr. Butchert and I sit on that committee. We all agree on those issues.

Mr. **Fazio**. There must be some additional people we could have on this panel. [Laughter.]

Mr. **Hall**. I think it ought to be a Federal representative.

Mr. **Fazio**. I think maybe you're right.

Ms. **Auer**. Maybe that's it.

Mr. **Fazio**. There's a general feeling here that the Federal taxpayer has a major role to play?

Ms. **Auer**. Has a role. We feel that the beneficiaries must pay as well. It isn't another, you know, looking to Washington at all, to bail out this whole program. That's unrealistic.

Mr. **Fazio**. Just like out-of-valley drainage.

Ms. **Auer**. Exactly.

Mr. HALL. I think you'll find, Congressman, that if you examine what's gone on at the local level since this problem shifted gears, there's been no reluctance to invest time, energy and money in solving it. The question is whether or not the local project participants ought to be made to pay for mistakes that were made by the Federal Government in the past.

Ms. AUER. May I just read a paragraph or two from the cover letter?

> In summarizing the Committee's position, we believe the principal responsibility for the cost of Kesterson cleanup should be borne by the U.S. Bureau of Reclamation, without reimbursement from water users.
>
> The very beneficiaries of the San Joaquin Valley Drainage Program should bear responsibility for payment and/or repayment of Drainage Program costs which are fairly attributable to them, and the cost of implementing solutions to drainage problems should generally be distributed by a formula which ties cost to benefits.

Mr. FAZIO. I guess I'm troubled by the assertion that the mistakes are those of the Bureau or the Federal Government, period. You know, we had some discussion earlier about assessing blame, in fact, when in reality the Bureau was implementing policies that Californians went to Washington to lobby for.

We've had a reversal in public attitude, and we ought not to take our frustrations out on the Bureau. I'm not sure that the Bureau was acting unilaterally when it implemented policies in these instances. I have a funny feeling they thought they were acting in concert with the interests of the water districts that were directly affected.

So I'm a little troubled, as a stand-back generalist here, that the water districts that are now paying the price feel it's some expert from the Bureau who blew it, when in fact we all know the Bureau delegated a great deal of authority to the water districts in the State, because that was in fact what local policy makers wanted.

Would you want to argue with that?

Mr. HALL. Well, I wouldn't argue with the fact that the Bureau was acting in concert with the intent of Congress to carry out drainage plans as well as providing irrigation service, nor the fact that that worked with the districts in trying to make the best plan that they could.

I'm not suggesting, and I don't think anyone else is, that the mistakes weren't due to necessarily incompetence, they were innocent mistakes, but they were mistakes. One of the biggest mistakes, in my view, is designating the Kesterson Reservoir as a wildlife refuge. It was an innocent mistake that the U.S. Fish and Wildlife Service made in trying to maximize the benefit of the water resources available. In retrospect, it was not a wise choice.

When you examine, though, the rather nominal benefits to the project participants, and their almost total lack of input in terms of how Kesterson Reservoir was designed, constructed and operated, I don't think you can conclude that they were an integral part of the process that led to the impacts at Kesterson Reservoir.

Ms. AUER. May I add something? My view is that nobody wanted to pay. The local people certainly didn't want to pay, the Federal Government didn't want to pay, the State Government didn't want to pay. Everybody that built these projects knew there was going to be a drainage problem, but there was a big argument endlessly about who was going to pay, and that's why we are where we are, and I think that signifies the real importance of this hearing.

Mr. FAZIO. I think you make a good point, and I know we have to get on with the next panel, I simply raise the issue, because I think it's a very valid, ongoing debate, that has to be resolved, or we're not going to make any kind of progress here. And no one's going to be able to be free from responsibilities financially. We're all going to have to find a way to apportion costs, or we're just simply going to be dead in the polluted water.

Mr. BUTCHERT. I agree with that certainly, Mr. Fazio. And I think we focused here in the drainage program on just two narrow repayment issues. Kesterson cleanup was the big one, the really big issue.

Mr. FAZIO. Sure.

Mr. BUTCHERT. Insofar as the future holds, we're now and have been paying 50 cents an acre foot for all the water delivery for drainage service. We're not getting any drainage service, but we're still paying that amount of money. We're obligated in the future to put up front costsharing, we're obligated to pay all the O&M costs, and we'll probably have to repay the cost of our facilities. We're reconciled with that.

Mr. FAZIO. Do you care to put that on the record as your contribution part to the question.

Thank you, Mr. Chairman.

Senator BRADLEY. Thank you, Congressman Fazio, for bringing up this point with greater clarity. It is an important point, and it's been illuminated by your exchange with the witnesses.

Let me thank all four of you for sharing your time with us. You've been very helpful. Thank you.

The last panel today consists of Jason Peltier, manager of Central Valley Project Water; David Schuster, consultant, State Water Project Association; Carl Boronkay, general manager of Metropolitan Water District, Los Angeles; Duane Georgeson, assistant general manager of Los Angeles Department of Water and Power.

Gentlemen, welcome to the Subcommittee, and we are, as usual, heading down to conclusion, so we're going to try and hold it to ten minutes for your presentations.

Mr. PELTIER. All together?

Senator BRADLEY. No, no, no.

Mr. PELTIER. I'll make my abbreviated——

Senator BRADLEY. Are you volunteering? [Laughter.]

Senator BRADLEY. Well, let's begin with Mr. Peltier, and followed by Mr. Schuster. Welcome to the Committee. I think this panel is particularly important, because we've heard from everyone now. Now I want to hear from those who actually use this water in many different ways.

STATEMENT OF JASON PELTIER, MANAGER, CENTRAL VALLEY PROJECT WATER ASSOCIATION

Thank you, Mr. Chairman, Congressman Fazio. My name is Jason Peltier, I'm the manager of the CVP Water Association. Our organization represents those water districts which have contracts with the United States for water out of the CVP. We deliver water to about 20,000 farmers and two million households, primarily in Northern California.

The 3 million acres of farmland we serve represent about a third of all the irrigated land in California. From a Reclamation-wide perspective, the CVP represents about a third of all the Reclamation lands in the nation, and almost half of the gross farm value, gross crop value is produced here in the CVP, from the total reclamation program.

Really, the CVP represents the best, in many senses, of what Congress intended in the reclamation program, and in many measures, has been the single largest contributor to the economic and social development of the Central Valley.

With a capital investment of about two and a half billion dollars, increased agricultural activity alone amounts to in excess of $40 billion, to say nothing of the flood control, hydro power, and other benefits of the project.

The development and management of California's water resources for the production of food and the benefit of the 28 million people in the State has dramatically affected the environment, there's no question about that. And the Central Valley Project carries its share of impacts.

We are at a big turning point in terms of our perspectives. I think we are recognizing, we in the water management community, are recognizing that public values are changing, and public commitments and desires relative to environmental values are growing all the time.

But something that hasn't changed is that the water demand hasn't changed, it just continues to increase, and our population continues to grow, and our groundwater overdraft problems in the San Joaquin Valley continue to grow.

How to reconcile these two conflicting facts of life is really the challenge before all of us, I think, in the water management community. And we can begin by reevaluating our mission, our purposes, and the way we do business. And I think the Bureau certainly is to be commended for their efforts in self-analysis and examining what it is that they are trying to do, in terms of water management in California.

And while some critics continually malign the Bureau for being the same old Bureau, the fact is that yes, they are still delivering the water and generating the electricity, and these are important building blocks of our infrastructure in the Valley, and so I hope the Bureau always maintains that same old Bureau, at least part of its personality, because that's what sustains us.

But largely unnoticed over the last few years has been the shift in priorities, work priorities and budget commitments in the mid-Pacific region of the Bureau, in terms of environmental restoration activities. Over the last three years about 30 percent of the regional budget has gone to environmental restoration activities, and this year alone about $77 million, or 67 percent of the regional budget is devoted to environmental restoration and study efforts, a tremendous commitment, I think.

The water users are fully supportive of the aggressive approach of the Bureau. Without question, we believe that environmental bodies, fisheries, wetlands, clean water and esthetics, can and must be compatible with water supplies, power, and other project purposes. They can be made more compatible through more sensitive operations, and through greater understanding of the biological factors of the river systems.

We're really happy with the Committee's desire to focus on these problems, because there is, without a doubt, a major federal interest in resolving the environmental problems, just as there is a major federal interest in maintaining a robust rural as well as urban economy in California.

We've provided a long list, and I'll hit a few of the high points here in a second, but we've provided a long list of things that need to be done to improve water management in California, and there's one very common element to most of them, and that's money. Environmental investigation and restoration activities are extremely expensive. And unlike other water management activities, it's more difficult to identify the beneficiaries.

Some will say that the water and power customers should carry the full cost of the environmental restoration work before us, but we disagree. The statutory mitigation requirements that have been placed on the CVP have been fully argued, this is a great point of debate between us and some of our counterparts, but we will maintain that the mitigation responsibilities have been met, the hatcheries and fish screens and minimum flow agreements, where they were put into place, were largely done to the specifications of the fish and wildlife agencies at the time.

But we can all recognize that in 30 to 40 years our understanding of impacts on the biological, on the environment, and other environmental impacts, and the mitigation related to the project is minimal by today's standards.

But as we look at the long list of restoration activities that we might want to undertake, we will have to be of the opinion that, while some costs may be appropriately allocated to us, the lion's share should be allocated as a non-reimbursible costs, Congressman Fazio's favorite words, we know. The cost should be spread widely, because the benefits of this restoration will be broad public benefits.

Another factor certainly affecting Federal environmental investment in California will be the costsharing requirements now emerging in Federal statutes. The need for and the political reality of cost-sharing of non-Federal financing requirements, I think has really yet to sink in out of Washington, but I think we can all recognize it to be a major impediment to new facility construction.

On the environmental score, there are several initiatives where the water contractors and fish and wildlife agencies are substantially in accord about what should be done, not necessarily, certainly not, about who pays and how it's operated and priorities and so forth. But in terms of physical work to solve problems, or institutional activities to begin addressing problems, I've listed eight items in my comments for you, I'll just flip through them briefly.

The temperature control structure at Shasta Dam; a new fish ladder at Red Bluff Diversion Dam; the improvement of water management facilities on wetlands and the development of additional supplies. Additional fisheries research; hatchery construction; the Sacramento-San Joaquin Delta stabilization; San Joaquin

River restoration; and Sacramento River restoration, are all items which are before us on the environmental agenda, and I think the water contractors that have a relationship with the Bureau of Reclamation are anxious to get moving on these items.

Since 1980, Congress has taken a number of actions which address environmental concerns in California, the Trinity River restoration program, Suisun Marsh, and the COA legislation. But they failed to address a number of water user concerns for project efficiency and the satisfaction of historical commitments. And while we're fully supportive of the actions to resolve the environmental problems, we must encourage broad examination of the overall water management and environment picture in California.

There are another set of problems or actions that Congress might take in this arena. These include the authorization of an O&M revolving fund for the Central Valley Project; approval of a wheeling-purchase agreement between the Federal Government and the State of California. Addressing the additional conveyance needs of the San Joaquin Valley, and additional storage needs on both on-stream in the case of Auburn and potential off-stream storage in the San Joaquin Valley, as well as continuing to work on the drainage problems.

I guess in closing, Mr. Chairman, I would say that there is much that Congress can do to help. And we are all aware of and concerned with budget realities. We're more aware of, and concerned with, the political realities here in California.

But if we, the water management and environmental communities, could reach some agreements on what is to be done, then maybe we could begin on overcoming some of the financial problems. But finding agreement, finding consensus, has been nearly impossible, and we had had such deep and fundamental conflicts that we have almost forgotten what progress is.

Thank you, Mr. Chairman, and hopefully this will be the beginning of some progress for us.

Senator BRADLEY. Thank you very much, Mr. Peltier.

[The prepared statement of Mr. Peltier follows:]

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Testimony Of The

CENTRAL VALLEY PROJECT WATER ASSOCIATION

Before The

UNITED STATES SENATE COMMITTEE ON ENERGY
AND NATURAL RESOURCES

SUBCOMMITTEE ON WATER AND POWER RESOURCES

SENATOR BRADLEY, CHAIRMAN

Field Hearing, Sacramento, California
August 29, 1989

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Good afternoon, I am Jason Peltier, Manager of the Central Valley Project Water Association. My comments today attempt to represent the very diverse views and hopes of our membership.

The Central Valley Project Water Association (CVPWA) advocates the interests of its members in State and Federal water policy and management forums. Our eighty members are divisions of local government--water districts--holding contracts with the United States for the supply of water from the Federal Central Valley Project (CVP). Our members are located throughout the Central Valley, from Redding in the north to Bakersfield in the south and in the San Francisco Bay Area. We deliver water to some twenty thousand farmers on three million acres of highly productive farmland in the Central Valley (one-third of California's irrigated land) and to some two million families, primarily in the San Francisco Bay Area.

We appreciate this opportunity to appear before the Subcommittee to discuss the wide range of water issues in California for which there is a Federal interest. We will briefly review the history of Federal involvement in the development and management of California's water resources and the complex nature of the challenges currently being addressed by our members and the broader water management community in our state. We hope to be fully responsive to the Committee's request for suggestions of how the role of the United States, through the Bureau of Reclamation, might be strengthened as we work together to resolve the environmental challenges we face. We will identify specific actions which may be considered if Congress wants to make progress in the advancement and modernization of water supply and management.

Today we are at a critical juncture in the history of California water development: a time of changing public values, a time of increasing water needs and periodic shortages, a time of increased recognition of environmental values and a time in our history when the fundamental values and objectives of water resource development in California are being questioned. The CVPWA is committed to moving aggressively in addressing the issues that currently divide the agencies and private interest groups; we are hopeful that conflict resolution can be undertaken in full partnership with the same agencies that have contributed so greatly to the development of California's water resource system. We are also hopeful that environmental advocates will join in the search for, and implementation of balanced solutions which both preserve the objectives of our water infrastructure and enhance our environment.

Early History

Before the large scale arrival of white settlers in 1849 with the discovery of gold on the banks of the American River, water management was carried out on a very small scale by the builders of the Mission system in California. Not only did the "gold rush" transform the human face of California but it also brought about the first intensive water development and management schemes to be seen in the Western United States. The hydraulic mining, the sluicing and other prospecting activities of the gold miners immediately altered the stream systems of the Sierra Nevada mountains.

In the 1850's, as gold miners left the foothills and moved to the floor of the Central Valley to begin growing food, the first of many water management conflicts emerged. Hydraulic miners washed mountains away in their search for gold; their massive dislocation of sediments destroyed stream beds and adversely impacted the ability of the shipping industry to navigate the rivers of the Central Valley. As mining diminished in economic significance, and as farming and the shipment of agricultural products became a greater part of the California economy, the courts resolved this conflict in favor of navigation. At the time, there seemed to have been little concern over the adverse effect of mining activities on the fishery resources. But certainly there was widespread destruction of spawning and rearing habitat as sediments entombed the river gravels and altered the Sacramento - San Joaquin Delta.

Western expansion pressures caused the first Federal survey of California water resources to be undertaken in the 1860's. The conclusions of this survey were simple and straightforward. They recognized the fundamental problems of inadequate distribution--both in time and place--of water resources in California. They identified as a solution a series of dams to conserve winter and spring flood flows and canals to transport this surplus water to the potentially productive farmlands in the Central Valley. It was however, some fifty years later, after several droughts and tremendous population growth before the voters of California approved the State Central Valley Project Act. This ambitious project would sustain the economic development of rural California and provide reliable water supplies, flood protection and electricity to farms and cities, by a system of works substantially identical to that proposed in the earliest Federal surveys.

With the advent of the depression, California was unable to sell bonds to finance the construction of the Project and turned to the United States for assistance. President Roosevelt, under the auspices of the Public Works Program, authorized the expenditure of Federal monies for the initial features of the Central Valley Project.

Today, fifty years after the initial work was begun, and after the passage of thirteen separate authorizing measures by Congress, the project is largely completed.

The Federal Central Valley Project (CVP) is composed of sixteen reservoirs, six hundred miles of canals and thousands of miles of distribution systems. From its inception and formulation, the CVP has been a single project in concept, design, operation and financing. It functions as a whole, not as a grouping of separate or independent units. The authorizing acts are replete with language demonstrating that Congress envisioned the CVP as a single, interrelated, and integrated project.

The Rivers and Harbors Act of 1937 contained the original authorization of the CVP and defined the purpose as:

> "...That said dams and reservoirs shall be used, first, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses; and, third, for power."

Subsequent acts of Congress authorized new features and project purposes. Expanded project purposes included protection of fish and wildlife, Delta water quality improvement and in some cases recreation and enhancement.

At times the authorized purposes are in competition and even conflict. This situation requires the Bureau to balance project purposes in the most acceptable fashion. This is a difficult responsibility, and most often a thankless task.

Relative to irrigation, the purpose of the CVP has never been focused on bringing new lands into production; rather, it was built to make existing farmlands more productive through the supply of supplemental water. The CVP has worked--and worked tremendously well--as some three million acres of farmland in the Central Valley, which formerly were able to produce only a narrow range of low value crops due to limited local water supplies, are now able to grow a wide variety of agricultural products. Products of higher value in the national and world marketplace such as fruit, vegetables, cotton, citrus, rice and grapes, are now grown with success. These higher value crops generate much greater economic activity and permit the employment of many more people at higher wages than the previous limited agricultural base could support.

In fact, the $1.4 billion of CVP costs allocated to the irrigation function has generated increased agricultural activity in excess of $40 billion. After considering this increase in primary economic activity, increased employment and local economic development, there is no question that the Central Valley Project has been the single largest factor in the economic growth and development of the Central Valley of California. This rural development and economic security has benefited not only the State of California and its people, but the Nation as a whole; California currently supplies approximately one-half of the fruit and vegetables consumed in the United States.

Federal/State Cooperation

The history of cooperation between the Government of the United States and the State of California demonstrates a highly productive partnership. Early water development investigations in California were coordinated among the Army Corps of Engineers, the Bureau of Reclamation and the State. The planning, design and construction of many Federal water facilities by the Bureau and the Corps have added greatly to the overall water management system in California. The passage of the Federal San Luis Unit Act in 1960 and the construction of the San Luis Unit facilities in full partnership with the State of California marked a true milestone in our cooperative efforts.

With the signing of the Coordinated Operation Agreement in 1986, a new high in Federal/State cooperation and coordination was achieved. Today, the State Water Project and the Central Valley Project are for many purposes operated as a single project. Reservoir releases are coordinated, Delta water quality impacts are monitored and met jointly by the projects, and exports from the Sacramento - San Joaquin Delta are coordinated to meet State - established water quality standards. The Bureau of Reclamation and its contractors are in full partnership with the State of California. After all, the authorizing measures of the Bureau, starting with the Reclamation Act of 1902 and all subsequent statutes, reflect the Federal policy of recognizing and operating in accordance with State Water Law.

As the demand for water supplies in California continues to grow and no new water management facilities are constructed, the existing system will be strained to achieve its authorized purposes. This demands even closer coordination. It demands even closer planning and a stronger commitment to operating Federal/State--and for that matter private water facilities--in harmony.

The Changing Water Picture in California

The history of water development in California has never been exemplified by broad consensus. We have always struggled in our decision-making efforts, as we have attempted to balance competing uses and conflicting demands for water. In the so-called "development era", the need for water resources to develop a strong agricultural base and provide for the growth of urban centers was the paramount force in moving ahead with the construction of dams and canals. In the 1940's and early 50's, as Veterans returned from the War and as tens of thousands of people migrated to California, the need for water to sustain growth brought about some of the most significant engineering and constructing feats of man. Little consideration was given to environmental values at the time. Some would argue that no balancing between human and environmental needs was performed, however, it can be said that there was a balancing, but the human needs for water to drink and water to grow food easily prevailed.

Now, entering the decade of the 1990's, we are witnessing the emergence and recognition of environmental needs as never before. Water for in-stream uses and water to manage wetlands are becoming, in many cases, the basis for water management decisions. This evolution of values presents an even greater challenge for the historic beneficiaries of water resource development. Our needs and expectations as to the operation of the water projects are being called into question, while at the same time our customers and potential customers are demanding more water, more reliable supplies, and water of higher quality.

All of us in the water policy and management field must be responsive to changing values. We should be leary of sweeping calls for the reallocation of water supplies from human to environmental uses, just as we should be concerned with the sweeping demand for the conversion of agricultural water to urban uses. Advocates of "reallocation" too often ignore the adverse economic and social impacts on rural California--impacts that responsible policymakers must be mindful of.

We are confident that as water resource decisions are made today and in the future, they will be more sensitive to environmental needs while not harming the traditional purposes of water supply, hydroelectric power, navigation, recreation, and water quality enhancement. As a fundamental tenet, we believe that water supply projects can be constructed and operated in harmony with environmental values.

One of our organization's goals is to see that the CVP and our individual district operations become more environmentally sensitive and more responsive to the changing public demands for environmental restoration. We see today in the Bureau of Reclamation a very aggressive environmental restoration and enhancement program. In fact, the Regional Office of the Bureau currently has in excess of thirty separate environmental restoration, study and construction activities underway.

The Mid Pacific Region has, over the last three years, devoted over $156 million or 30% of its budget to environmentally-oriented activities. In 1989, $77 million or 67% of the Regional Budget was devoted to these purposes. For the next two fiscal years, the Bureau forecasts expenditures on environmentally-related activities to be approximately $146 million or 52% of their budget. If dollars can be used to measure commitment, the Bureau in California is rising to the challenge of changing public values.

The Federal water contractors are supportive of the Bureau's new mission and its greater emphasis on environmental activities.

The Bureau is to be commended for their critical self evaluation and initiative in refocusing their direction. As the role of the Bureau evolves and broadens to meet the changing expectations of the public, it is important that Congressional support be redoubled and the talents of the Bureau be put to the best possible use. We have supported legislation authorizing new missions for the Bureau such as the restoration of the Trinity River, as well as, the inclusion of appropriate costs into our repayment obligations. We fully recognize that the problems of the past must be addressed now before progress on other water management issues can be made. We feel strongly, however, that Congress must begin addressing our needs for project optimization and the environmental needs in unison.

Since the early 1980's Congress has authorized the Bureau of Reclamation to undertake numerous environmental activities (Trinity River restoration, Suisun Marsh facilities, the Coordinated Operation Agreement) and has continually appropriated funds to carry out an aggressive environmental program.

Over this same period, many water user needs have gone unaddressed. Our concerns about maximizing the efficiency of the Project, concerns about inadequate maintenance of the aging CVP facilities, concerns with continued groundwater overdraft, and frustration with inadequate progress on historic project commitments have received inadequate attention. Before we discuss specific actions which the United States might undertake, we would first ask that consideration be given to the context in which policy decisions are made.

It is our great desire to see the traditional water development interests and the traditional environmental interests work in greater harmony to seek consensus and identify common grounds on which progress can be made. It is clear in the water resource management field that there are few win-win options; in most cases decision makers must make trade-offs, and decisions on the allocation of benefits and costs must be made. The politics of resource decisions today show us that virtually every interest has veto power. We can all frustrate progress, we can derail decisions that may harm us and we can always call for perfect knowledge. Negotiated agreements and a willingness to compromise seem to frame the process for progress.

We understand the purpose of this hearing and the interest of the Senate Water & Power Resource Subcommittee in making progress on a wide range of California water issues through the development of greater common understanding. We applaud your efforts and encourage your continued activities along these lines. In some cases all of us are too fixed in our positions; we know what we are fighting for and we dig our heels in. Maybe, as we enter the 90's, we should all look for a new way to do business. We should look for common benefits, common interests, and common successes.

Environmental Concerns

While there exists a long list of potential actions that Congress might take in the environmental restoration area, it must be recognized that over the last few years a fundamental change has occurred in the manner in which the Central Valley Project is operated. The change grew out of the frustration of Bureau operators' and fishery agency biologists' failure to communicate and failure to understand each others' needs; thus causing needless damage to our fishery resources. Today, the level of consultation, coordination and understanding between the operators and the biologists is yielding tremendous benefits for the fishery resources.

The Bureau appropriately approaches discussions of changing project operations for fishery purposes with its authorizing statutes and several fundamental requirements in mind;

1) The contracts for supply of agricultural and urban water must be met.
2) The flood control requirements of the Project must be fulfilled.
3) Water quality standards in the Delta must be met.
4) Hydroelectric power production should be optimized and public health and safety must be protected.

Over and above these basic operational criteria there exists considerable flexibility in the manner in which the project can be operated. We are finding ways to operate the CVP today that were never envisioned by its builders. We are finding that with greater sensitivity to the needs of the fisheries in terms of flow and temperature requirements, and in operating experiments to gain biological data on fishery impacts, the benefits of the CVP can be spread further without damaging those who currently rely upon it.

Before discussing specific actions of Congress on the environmental front, we must consider where the money will come from--who pays? It is clear that the development of our Nation's premier agricultural economy and the growth of population in California to some 28 million people have dramatically altered the natural environment. Some changes have been caused by the Central Valley Project, however, if one were to "assign responsibility" one would have to look much further than the CVP. They would have to look at hundreds of thousands of development decisions made by local government, of statewide decisions on the development of our infrastructure and uncountable individual decisions associated with carving out a living and building this state.

The San Joaquin River provides a good example of how the natural environment has been altered and what we might do to restore it. Yes, Friant Dam, completed in 1942 adversely impacted the river. But when one looks at the entire San Joaquin River system it is easy to identify a much, much larger community of interests that has benefited from stream-impacting local development projects, many of which were constructed long before Friant Dam. Upstream hydroelectric development, primarily by Southern California Edison, has greatly impacted river flows and natural fish habitat. Downstream from Friant Dam, near the town of Mendota, the first diversion structure was built in the late 1800's by Henry Miller, a pioneer who did much to promote early settlement and agricultural development. Further downstream, agricultural diversions and urban growth have impacted the river and its tributaries. Virtually every tributary river to the San Joaquin had some form of diversion structure or reservoir built across it by the turn of the century. Today, the San Joaquin River and its tributaries are dotted with dams, reservoirs and diversion structures.

It is fair to say that we have a consensus today that restoration of the environmental values of the San Joaquin River is a desirable and worthwhile objective. The Bureau of Reclamation is developing what we hope will be an effective and widely supported environmental restoration program. When we get to the next question of how much can we afford to pay and how will the costs be spread for the improvement of San Joaquin River, it is important to keep in mind all of those who, in the broadest sense, bear responsibility for the conditions of the river today. And we must keep mind all of those who have benefited from the food grown, the homes built and the electricity generated with the water of the San Joaquin River; the people of California and our Nation as a whole have benefited. And who will benefit from improving the river? All of these factors point to spreading the costs of restoration as far as possible. If we develop a new public policy priority that the River is to be restored and enhanced, much can be done with new public works to achieve this goal.

Congressional Actions-Environment

We have identified below several activities which Congress may act on, either through authorization or appropriation. The CVPWA is most anxious to participate in deliberations on these matters; both to support progress and insure that the costs are distributed appropriately. As previously mentioned, because these measures will enhance and improve current conditions, and because the broader public will benefit, we feel the costs should be spread broadly.

1) **Temperature Control Structure at Shasta Dam:** We all can agree today that a mistake was made fifty years ago when Shasta Dam was built; it should have been built with a multi-level outlet structure to permit the release of water from different depths of the reservoir for the enhancement of downstream river temperatures. Today, the need for a temperature control structure is clear and current Bureau estimates for the construction of multi-level outlet works at Shasta range up to $50 million. This construction requires authorization by Congress and should proceed as soon as possible.

2) **Red Bluff Fish Ladder:** When the Red Bluff Diversion Dam was built in the early 1960's the best biological input concluded that two ladders at Red Bluff would be sufficient to meet the needs of migrating fish. Clearly history has demonstrated that the existing ladders and configuration of the Red Bluff Dam are inadequate for the passage of fish both upstream and downstream. A new fish ladder at Red Bluff needs to be constructed; the Fish & Wildlife Service has proposed the construction of a large bypass ladder taking most of the flow of the Sacramento River around the dam along the east bank. The Bureau should complete its review of the Fish & Wildlife Service planning report, initiate design, and proceed with construction immediately. Action by Congress to speed up the resolution of fishery problems at Red Bluff may be needed.

3) **Refuge Water Supplies:** Before the first Federal construction activities on the CVP were begun in the 1940's much of the prehistoric seasonal wetland areas of the Central Valley had been destroyed by the activities of man. The construction of flood control systems, the reclamation of swamp and overflow lands, the construction of levees in the Delta, the conversion of the Tulare Lake Bed to agricultural production and numerous other factors substantially diminished wetland habitat in the Central Valley. Today the existing wetlands need additional and more reliable water supplies in order to maximize their benefit to the migrating waterfowl of the Pacific flyaway. While some of this water may come from existing unallocated yield of the CVP, it is clear that by simply constructing more efficient water management facilities on the refuges, strategic water transfers and by constructing ground water extraction facilities in or around refuges, enhanced water supplies can be obtained.

4) **Sacramento River Restoration:** Federal legislation authorizing certain activities outlined in the State Sacramento River Restoration Report (S.B. 1086) may greatly enhance the ability of the Bureau of Reclamation and other Federal agencies to participate in the restoration of the environmental values of the Sacramento River. This legislation could be similar in many fashions to the Federal Trinity River Restoration Program. The Trinity River model has proven to be successful in terms of Federal agency coordination and coordination between the Federal/State and local government interests.

5) **Additional Hatchery Construction:** The United States should pursue independently or in conjunction with the State of California the construction of additional hatchery facilities to enhance both the salmon and the striped bass populations of the Central Valley.

6) **Fishery Investigations:** Millions of dollars have been spent by the United States and the State of California in attempting to identify and understand the causes behind the decline of certain fishery resources of the Central Valley. Much is yet to be learned. We must have a better understanding of the biological factors associated with the decline and evolution of these fisheries. Is it project operations, pollution, domestic or international commercial fishing, sport fishing, inadequate food resources, predatation, or other as yet unidentified factors? Until we are able to understand and measure the impacts these factors have, identifying more environmentally benign actions and appropriate restoration and enhancement activities (particularly in the Delta and San Francisco Bay) will be severely hampered.

Congressional Action To Improve Existing Federal Water Facilities In California

Over the last decade Congress has taken several actions authorizing new activities within the CVP Service area. However, few of these activities have dealt with either the nuts and bolts of improving project efficiency or reached into the bigger picture of developing new water management facilities. The items outlined below all have two things in common: they will improve the efficiency and reliability of the Central Valley Project and they will enhance the contributions of the project to the beneficiaries of the project and the State of California as a whole. The first category of potential actions by Congress fall in the area of financial affairs;

1) **Revolving Fund:** Congress should take action as soon as possible to establish an O & M Revolving Fund. Such a fund would insure adequate and consistent funding for the operation and maintenance of the CVP. As the CVP is approaching forty-plus years

old, greater attention to the Federal water infrastructure in California is required. There is no cost to the Treasury associated with a Revolving Fund, in fact, savings will accrue as preventative maintenance replaces much more costly "breakdown" maintenance.

2) O & M Deficits: In 1986 when Congress passed public law 95-546 (which reauthorized the CVP to meet Delta water quality standards), included in this measure was a requirement that interest be paid on Operation & Maintenance deficits. Water districts are now attempting to avoid the situation where their O & M payments do not cover the actual O & M cost allocated to them in a particular year. In other words, the legislation which was designed as an incentive to keep deficits from accruing is working. However, given the accounting and the budgeting cycles of the Bureau of Reclamation, water districts are having difficulty avoiding the accumulation of deficits even when our member agencies raise their water rates in an attempt to cover all of the costs allocated to them in a given year. One solution to this problem would be to authorize the Bureau to account for and charge for water based on the cost of the previous years' operations. This would permit districts to know exactly what the cost of water is for a given year and charge their water users accordingly.

3) Drainage Repayment: In 1960 when Congress passed the San Luis Unit Act, one of the key requirements of that statute was the construction of a master drain in the San Joaquin Valley to remove saline groundwater. The drain was never completed. The Bureau has, none-the-less, expended a tremendous amount of money on the drainage problem including millions of dollars at the failed Kesterson Reservoir. Currently the United States is spending several million dollars annually on the overall San Joaquin Valley Drainage Program. This joint State/Federal program is supposed to identify solutions to the long term drainage problem affecting both State and Federal service areas. All of these costs are currently being allocated to the San Luis Unit capital account. We believe Congress needs to provide guidance on the appropriate allocation of these costs.

The basic principle behind cost allocation in the CVP, and for that matter in all other Federal water projects, is that the beneficiaries pay for the benefits they receive. Certainly the benefit accruing to those farmers on some five thousand acres who were able, for a few years, to dispose of their drainage water in Kesterson in no way matches the tremendous cost allocated to the construction, operation over several years, litigation, regulatory action and subsequent clean-up of Kesterson Reservoir. All of the costs associated with Kesterson Reservoir should be allocated as nonreimbursable expenses.

Relative to the broader drainage program, there is great expectation that this program will produce valuable information and guidance for managing the drainage problem well into the future. While it is clear some benefit will flow from this program to the farmers, their repayment obligation should be based on direct benefits. For instance, the Fish and Wildlife Services has done extensive selenium toxicity studies on Mallard ducks. This basic scientific research is of broad public benefit and the cost associated with this and other basic research should appropriately be born by the broader public.

4) **Treatment of Enhancement Costs:** As was previously mentioned, the Bureau has undertaken an aggressive environmental restoration and enhancement program in California. The Secretary of the Interior, however, cannot fund these efforts unless they are specifically authorized or considered mitigation for past project impacts. The lack of adequate authorizations for new environmental work has meant that much of the Bureau's environmental work is being charged to the project beneficiaries simply because this is the only basis under which it can be done. Much of this work is dealing with problems quite apart from impacts of the CVP. In fact, we maintain that all of the statutory requirements for CVP mitigation have been met.

Congress should consider giving the Secretary greater authority to determine which activities of the Bureau are appropriately deemed mitigation and thus reimbursable and those which are serving a broader public benefit and are appropriately non-reimbursable.

Congressional Action-Water Management Facilities

Congress has authorized and funded the construction of an extensive variety of facilities to physically accomplish the policy goals of water development in California. Most of the facilities authorized are now in service; for some, such as Auburn Dam and the San Luis Drain, construction was begun but stopped prior to completion.

To date $2.4 billion has been expended for construction of project facilities. The full repayment of costs allocated to the water supply and power functions will be accomplished by the year 2030.

When we consider the construction of additional CVP facilities four key factors must be reviewed:

1. **Project Accomplishment:** Will the construction further the historic mission of the CVP in addition to addressing future water supply and management needs?

2. **Environmental Sensitivity:** Will adverse environmental impacts be minimized and will environmental enhancement objectives be accomplished?

3. **Economic Justification:** Do the project benefits exceed project costs and will the costs be financed and allocated in a manner consistent with sound public policy?

4. **Project Suitability:** Is the proposed facility sound from an engineering standpoint and is it the best, most desirable option for resolving the problem?

The following list of facilities has surfaced over time as potential solutions to existing problems. The Central Valley Project Water Association has not endorsed all of these proposals but wishes to bring them to the attention of the Subcommittee as a means of demonstrating that specific solutions are available to some of the water management problems before us.

1. **San Joaquin Valley Conveyance Facilities:**

   Problem: The existing groundwater overdraft of 1-2 million acre feet per year will, if not reversed, adversely affect the economy of the Central Valley. In addition the project could provide additional water to enhance wetland and fishery values.
   Solution: The construction of additional conveyance facilities to transport surplus water from Northern California. There is presently no additional Federal capacity for Delta exports to meet today's needs, let alone future needs.

2. **Additional Water Storage:**

   Problem: Existing demand for water now exceeds available supplies in several locations. Within the next three decades, more frequent and in some cases, catastrophic shortages will occur. The planning horizon for new storage facilities is long and the approval and funding process even longer.
   Solution: There are two types of storage facilities that can be built: onstream and offstream.

   a. **Onstream Storage:** Auburn Dam was authorized as a component of the CVP in 1965 and $300 million has been spent to date on construction. Since the time construction was halted, increased municipal and environmental demands for water and recently recognized flood control requirements downstream justify the completion of this multi-purpose facility.

b. **Offstream Storage:** The United States should consider participating in the State Authorized Los Banos Grandes Reservoir and Contra Costa Water District's Los Vaqueros Reservoir. Both of these facilities will withdraw high quality surplus water from the Sacramento-San Joaquin Delta and provide much needed security for major metropolitan areas. In addition, off-stream storage investigations on the east side of the San Joaquin Valley should be continued and advanced.

3. **Completion of the Tehama-Colusa Canal:**

Problem: Long range municipal and industrial needs for water in Yolo and Solano counties exceed available supplies, in addition unmet agricultural commitments of the project exist in Yolo County.
Solution: The completion of the last reach of the Tehama-Colusa Canal and the terminal storage facility will enable the delivery of project water to these uses.

4. **Delta Water Management:**

Problem: Inadequate channel capacity in the Sacramento-San Joaquin Delta contributes to water supply, fishery and flood control problems.
Solution: The United States, through the Bureau of Reclamation and Corps of Engineers should participate in the efforts of the State Department of Water Resources to resolve these immediate problems.

In addition to these identified solutions to existing problems, there exists two major problems for which solutions have yet to be identified.

1. **Long-Term Delta Problems:** The United States must contribute to the resolution of the seismic vulnerability, fishery, water management and public health problems associated with the waters of the Delta.

2. **San Joaquin Valley Drainage Problems:** Joint Federal/State efforts to identify environmentally and economically sensible solutions to the agricultural drainage and salt balance problems must continue in some form.

Non-Structural Solutions

There are current policy and contractual initiatives under development which will contribute greatly to the improved management of existing water supplies. The first, and most clearly defined, is the execution of the Federal/State Wheeling Purchase Contract as generally endorsed in P.L. #99-546. This contract will more fully integrate the water supplies and conveyance facilities of the CVP and the State Water Project through the exchange of excess Federal water supplies for excess Delta export capacity of the state project.

The contract has been the subject of negotiations for 26 months now and we are hopeful that it will be available for Congressional ratification by the Spring of 1991.

Also in the area of non-structural or policy improvements, more progress needs to be made in the refinement of policies which encourage the short-term transfer and exchange of CVP water. In the process of developing these new policies great care must be taken to protect all parties from adverse economic and social impacts.

Rural communities that have been built on the foundation of CVP water supplies are understandably fearful of sweeping calls for the reallocation of water under the banner of "water marketing". The term "water marketing" has grown to be synonymous with calls for the transfer of water from rural to urban areas.

Rural California is intimidated by the economic and political strength of the cities. They are troubled by the lack of sensitivity as to the harm that can result from the loss of water. Even the threat of such a loss shakes the economic security of their communities. Both sectors can, however, benefit from more sophisticated transfer mechanisms, especially in dry years. In dry years urban conservation has its limits, but certain agricultural areas can greatly reduce water use for short periods. They can and will, given appropriate economic, institutional and legal protections.

Lastly, and as a matter which may cross the lines of both structural and non-structural initiatives, the role of the United States in the advancement of irrigation technology and urban conservation needs to be re-examined. Great strides have been made over the last decade in the development of more efficient irrigation hardware and practices for agricultural and urban applications. But there remains much to be done. Economic assistance to spread new technology, and a greater investment in development of new technology and plant breeds may be needed.

Conclusion

Our testimony today has covered a great number of the water resource challenges and opportunities we face in California today. The economic, legal and political realities which define the public policy development process defy simple answers and easy progress.

We have not begun to do justice to the breadth and depth of factors which must be considered as we attempt to make progress. Certainly agreement on some general matters is attainable. For instance, most would agree that:

--We need to do a better job of protecting and enhancing the environment.

--Greater efficiencies in the management of existing supplies can be achieved.

--Broader benefits can be derived from existing supplies without adverse economic and social impacts.

--Maintaining and strengthening water system reliability is essential as demand continues to grow and system flexibility is strained.

An attempt to take any one of these principles to the next level of detail, however, will elicit strong debate from many quarters. The complexity and uncertainty associated with these principles grows exponentially as they are explored.

The growing difficulty of making water resources decisions leads to greater frustration, hotter rhetoric, divisiveness and anger. This is the recipe for paralysis, for indecision and a breakdown in public confidence.

It is in everyone's interest to begin working together. We can find some common ground and begin making decisions again.

We appreciate the willingness of the Senate Water and Power Subcommittee to take the time to listen to our challenges as you explore a new role for the Federal Government in resolving water problems in California.

Thank You.

Senator **Bradley**. Mr. Schuster.

STATEMENT OF DAVID SCHUSTER, STATE WATER CONTRACTORS

Mr. **Schuster**. Thank you, Mr. Chairman and Congressman Fazio. I want to thank you for giving the State Water Contractors the opportunity to share our thoughts on Federal water policy pertaining to the Bureau of Reclamation.

The State Water Contractors is an organization that represents public agencies that purchase water from the State Water Project. And we don't normally get involved in Federal issues. In this case, however, we welcome this opportunity because we need both the Bureau and Congress' help to implement our goal in trying to resolve some of the outstanding and longstanding fish and wildlife problems here in California.

I need to try to explain what we're doing, but there's been a stalemate in terms of solving our water supply problems in California for a long time, due to legitimate concerns about the environmental impacts the existing water system has had on the environment, the impact on environment.

This conflict has long been characterized was being unsolvable, basically that fish and wildlife cannot coexist with water development and water supply needs of the people. An example of the kind of dilemma we have had is that in the past, at least, most solutions proposed by fishery experts to solve salmon or striped bass issues would entail basically putting flow conditions in the Sacramento and San Joaquin River and the Delta back to pre-project levels, in other words, no projects.

We, on the other hand, the water folks would fight that estimate to try to maintain our existing economy and California lifestyles. We'd always add to the polarization of the process by adding, of course, that people are more important than fish and wildlife, and everybody knows that anyway.

This stalemate, or this almost complete 180 degree position as far as philosophy has come to be known by us, at least, as a fish versus people syndrome. It's led to nothing happening, it's led to continuing declines in the fisheries, continued declines in waterfowl populations, and also no action in terms of meeting our future needs here in California from a water supply standpoint.

We think that, although there's many people that still embrace the fish versus people syndrome here in California, with lately EPA's California staff being the most notable, overall we think there's been a break in the stalemate. A break due to frustration, and actually, I think, caused by the reaction to the State Water Resources Control Board's draft plan when it was released last November.

The furor around that draft plan, the ultimate withdrawal of that plan led, I think, most people that really do care about having more fish, more ducks, and more water, to the conclusion that existing efforts where we continue to fight each other, leads to nothing. In that plan, the Board clearly chose fish and wildlife needs over people.

The breakthrough that I see as happening with most key players, some of which you heard today, from people like Pete Bontadelli, most notably, but also Dave Kennedy, has led to a flurry of activity that I find exciting in terms of people looking for solutions to the upper Sacramento River salmon problems, solution to the Delta problems, and have started at least to look at some of the problems that exist in the San Joaquin River.

From the standpoint of the Bureau of Reclamation, since they control a great portion of the water here in California, they're key, if we're going to be successful in what I'm going to call a new movement where we're going to try and cooperate together to solve some problems. We the contractors have been impressed with the management staff being put together here in California by this new Administration.

We know them, we believe that they have the attitude and professional skills to be able to carry out some of the things that we're talking about doing.

You asked what we really need at this point in time, any kind of administrative reforms, or changes in reclamation law to actually be able to help the Bureau perform a task that we and you would like to see them do. And I think the answer is no. I think we've known for years how to solve some of these problems. More appropriately, it's time to start doing it and stop talking.

However, we do have some policy recommendations to make to the Bureau, in this case through you. One of them is, we think that the Bureau in this region needs to set some clear priorities in terms of what they're going to try to do first, with all the problems that they've got being dumped on them at this time by everyone.

From our point of view, we'd like to see the Bureau place resolution to some of the outstanding fish and wildlife issues you've heard about today as first priority. We doubt seriously that things are going to move forward in any serious way until we actually break the stalemate, and we can't break the stalemate until we start proving to other people that we're sincere in terms of solving some of these problems.

In addition, I don't think the Bureau can actually go out and sell new long-term contracts for water until they actually know the reliability of that water. And existing long-term contractors can assess what kind of impacts those contracts will have on the reliability of their water.

And I guess my major reason for doing it is that the attitudes toward the Bureau have taken at least 20 years to build over the years. I think the Bureau needs some successes in solving some of the Sac River salmon problems, or the American River problems, just by changing some of those attitudes. I think if we have some successes together, they can't do it by themselves, we all need to do it, some of the hostility, almost blind hostility that they receive daily might start changing as people start believing that they really are trying to be the quote, unquote, "new Bureau."

Second thing we'd like to see changed in the new Bureau's policy, in this case, is for them to reevaluate their participation in California's effort to try to solve some of the water transfer issues within the Delta.

The Bureau has not been—let me say it a different way. A lot of the solutions that have been offered today, such as trying to stop reverse flows in the Delta and the negative impacts those reverse flows have on striped bass, some of the redistribution or water marketing ideas in terms of moving water around among different players, some of the ideas we've had in terms of trying to maintain higher minimum flows, those things cannot be done without significantly impacting the CVP and the SWP unless we do something to solve some of the water transfer issues that we have in the Delta today.

A lot of the California water leaders today seem to want to ignore that issue, because it's so politically sensitive, but I think it's time for the Bureau, if they're sincere, and others to join our efforts to face that head-on.

We also need Congress' help. We need three things from Congress. One thing, we need to change attitude from some of the members, two notable exceptions, of course, being the two that represent Congress here today. But I think it would be very helpful if some of the Bureau-bashing that goes on continually stopped. It may play well at home, it may work from that standpoint, a political standpoint, but all it's doing today is basically adding to the polarized feelings that are stopping us from moving forward in California.

Secondly, I want to reinforce what Dave Kennedy and Pete Bontadelli said today. In that sense, the Bureau, over the last 20 years, has seen their staff, both in numbers and special skills, decline. And it needs to be rebuilt, and we need your help to do that.

One more thing from Congress, but a lot of solutions that we're talking about in terms of any of the issues, the Sacramento, the temperature control structure, each one of those are going to need some kind of authorization, appropriation from Congress, and we're going to need your help, both in terms of funding, but also oversight to help us do that.

One thing I want to add. I used to work in Washington, too, and I've listened to us talk. Normally, we in the field, so to speak, have a tendency to say, leave us alone until we solve the problem, and you guys can pay for it. We're not really saying that here. Basically we're going to need help from Congress in looking for ways to help us pay for it, some help from Congress in terms of funding.

The only reason people like Dave Kennedy say we're not coming to you right now is, we really haven't totally got our act together. We're not asking you not to be part of that process, we're asking you to actually be actively part of that process, but don't expect a solution within the next three or four months.

Thank you, sir.

Senator **BRADLEY**. Thank you very much, Mr. Schuster.

[The prepared statement of Mr. Schuster follows:]

TESTIMONY OF DAVID SCHUSTER
Before The
SUBCOMMITTEE OF ENERGY AND NATIONAL RESOURCES
United States Senate
Hearing, August 29, 1989

Mr. Chairman:

My name is David Schuster and I am here today representing the State Water Contractors. I want to thank you, Mr. Chairman, for allowing me this opportunity to offer the contractors' thoughts concerning the Bureau of Reclamation's role in resolving California's long-standing water supply issues.

The State Water Contractors is an organization that represents public agencies that have purchased water from the State Water Project (SWP). The contractors do not usually have a direct interest in federal issues. In this case, however, we do because we need the Bureau's and Congress' help in implementing our policy goal of solving fish and wildlife issues in California. Let me explain.

Something very important is happening in California's on-going water battles. Resolution of statewide water supply problems have been stalled for years because of concerns about the impact of existing water development on the environment. This conflict has almost always been characterized as unsolvable because fish and wildlife values could not co-exist with water development. For example, all solutions proposed by fishery experts involved restoring Sacramento and San Joaquin River and Sacramento-San Joaquin Delta flows to pre-project levels. Do away with the projects, in other words. Water people fought for maintaining existing lifestyles and argued that people are more important than fish or wildlife. Fish and wildlife advocates argued that all fish and wildlife resources would be lost if water development was allowed to exist as we know it today. I call this the "fish versus people" syndrome. The resultant stalemate has blocked all efforts to meet California's ever-increasing demand for water and in continued degradation of fish and wildlife populations.

Although there are many who still embrace the "fish vs. people" theory, with EPA's California staff being most notable, I believe there has been a significant break in that stalemate. That breakthrough came as a result of reactions to the State Water Resources Control Board's November 3, 1988, draft "Salinity Control Plan." The Board placed fish and wildlife values above the needs of people in that plan. The resultant furor and withdrawal of that plan convinced everyone truly interested in more fish, more wildlife, or more water that continuing the present course of action will hurt everyone. Fish and wildlife populations continue to decline with nothing significant being done to increase those populations and California marches on to inevitable severe water shortages: Shortages that will result in severe economic impacts and could force the people to place their needs higher than the needs of the fishery or wildlife.

This breakthrough in the "fish vs. people" stalemate has resulted in an exciting flurry of activity in the Delta, on the Upper Sacramento River, the lower San Joaquin River, and San Joaquin Valley as we look for ways to increase fish and wildlife populations and to meet the water supply problems of the people of California. The problem statement today is not "fish vs. people;" it is we must find ways to restore the fish and wildlife populations in the Central Valley to reasonable levels while meeting the reasonable water supply needs of the people in the Central Valley, Southern California, and the greater San Francisco Bay area.

Since the Central Valley Project controls a significant portion of California's water supply, the Bureau of Reclamation involvement and assistance in finding practical solutions to the fish, wildlife and water supply issues are critical. You have asked whether or not there's a need for administrative reform or changes in Reclamation Law to enhance the Bureau's role in resolving California's water resource conflicts. -The answer is no. We have the administrative and legal tools we need plus we know what the physical options are. It's time to start implementing those options. Stop talking and start doing.

The contractors are impressed with the management team being assembled by the Bureau here in California. They have the professional skills and attitude required to help California move forward positively. We do have two policy recommendations for the Bureau. First, the Bureau must set clear priorities here in California. We believe that resolution of fish and wildlife issues must be given top priority at this time. We must find practical solutions to these issues before new long-term water service contracts can be entered into. The Bureau can't determine how much firm water supply the CVP has available for sale until they know how the project must be operated to assist restoration of salmon populations and the restoration of wetlands. The new water service contractors need to know how reliable the water supply is they are contracting for, and the existing water service contractors need to know the impact of the new contracts on the reliability of their water supply. Many people do not believe the Bureau is sincere in its attempts to help resolve water and environmental issues. It will take a long time to change attitudes that have been formed over the past 20 years. If the Bureau starts acting in accordance with recent policy statements and if the Bureau helps resolve some of the Sacramento and American River salmon issues, for example, new attitudes outside of the Bureau and within the Bureau will be formed that will greatly assist the sometimes blind hostility faced by the Bureau in California today.

Second, the contractors believe the Bureau's policy concerning the Delta water transfer issues must be re-evaluated. Most of California's options for resolving water resources issues such as reserve flow impacts in the Delta on striped bass, redistribution of water through water marketing, greater use of existing surface water supplies through conjunctive use, and maintaining adequate fall flows for salmon and steelhead in the Sacrament and American River flows can't be utilized without significant negative impacts on the SWP and CVP water supplies unless water transfer facilities are constructed in the Delta. Most key water leaders in California seem to want to ignore this fact because of the political sensitivity of the water transfer facilities issue. The contractors believe it's time to face this issue head-on and the Bureau should join these efforts if they are sincere in resolving California's water resource conflicts.

California will also need Congress' help in resolving our water supply problems. First, we need a change in attitude of some of the key congressional players. Bureau-bashing must stop. It may be fun and play well at home, but it hurts our efforts to cooperatively solve problems by reinforcing the negative polarized attitudes. Second, the Bureau's staff has been seriously degraded both in numbers and in terms of professional skills the past 20 years. Presidents Nixon, Ford, Carter, and Reagan all played on the anti-bureaucracy feelings of the public to get elected. Their efforts have resulted in a weakened Bureau of Reclamation that needs help if it is going to play a significant role in the ambitious program I have outlined in this testimony. The Bureau's inability to implement some of the programs they have recently proposed is due to a lack of staff in most cases and not due to a poor attitude as some have alleged. More funds, more staff, and greater use of consulting firms will help this problem. Third, almost every solution to California's environmental problems will require Congressional authorization and appropriations. We will need Congressional assistance and oversight if we are truly going to solve California's water resource conflicts.

The State Water Contractors believe California is on the verge of moving into an era of cooperation that will result in a healthy well-managed water supply environmental systems. We ask for your help in that effort. Once again, thank you for allowing the contractors the opportunity to testify before your subcommittee.

Senator **Bradley**. Mr. Boronkay.

STATEMENT OF CARL BORONKAY, GENERAL MANAGER, METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Mr. **Boronkay**. Thank you, Mr. Chairman.

Senator **Bradley**. You will be speaking for urban users?

Mr. **Boronkay**. Yes, Southern California Urban users in particular. I appreciate the opportunity to address both you and Congressman Fazio on the important matter of an urban perspective on California's water problems.

I'm the general manager of the Metropolitan Water District of Southern California. That's a public agency that was organized in 1928 to supplement the local supplies of cities along the coastal plain of Southern California. Today we're composed of 27 member agencies, basically cities, and districts in which there are many cities.

Our service area is 5,100 square miles, involving six counties of Southern California. Some 14 million people live in our service area, and about half the water utilized there is supplied by Metropolitan.

Our sources of supply stem back to a contract with the Bureau of Reclamation from 1931 for 1.2 million acre feet, a very substantial amount of water. Our second major source is the State Water Project, and that's for about two million acre feet. We deal in big figures, we have a big population.

As a result of long-term planning and the investment of many, many hundreds of millions of dollars, we have a very healthy economy in Southern California, with over seven million jobs and an annual gross regional product of over $250 billion.

But that healthy economy rests on a reliable water supply, as it always has. So let's take a look at the water supply situation today.

The 1.2 million acre feet contract with the Bureau is worth less than half of what we anticipated, as a result of a 1963 decision in the case Arizona v. California. California was cut back when there was insufficient water, to 4.4 million acre feet as a reliable amount, and as a result of that, and priority system among California agency users of California's supply of the Colorado River, Metropolitan takes the shortage.

We have a priority that's behind three California agricultural agencies, they have priority to 3.85 million acre feet. California is cut back to 4.4, that leaves 550,000 acre feet for Metropolitan and its priority, less than half of what we'd been relying on.

Take a look at the State Water Project, and we thought it would make up for the loss in that case. The State Water Project is a deficient one, it's contracted to 30 public agencies for 4.2 million acre feet, it can deliver us about 2.3. There has been little progress in the last decade or more in moving facilities along.

And even the amount exported today from the Delta on the State Water Project is subject to severe attack in hearings before the State Water Resources Control Board.

A third source of water to Southern California is that of the City of Los Angeles, basically imports from the Owens Valley and the

Mono Lake Basin. They supply basically the City residents, but it's a substantial part of Southern California's water supply.

My friend here, Duane Georgeson, will tell you they've been in litigation for over a decade, they stand to lose a substantial portion of their imported supply. If that's the case they can turn to Metropolitan, as a member of Metropolitan, and merely shift that loss to Metropolitan, placing that burden on the rest of Southern California.

Groundwater is the final source of water to Southern California, apart from reclamation and conservation projects. Groundwater accounts historically for about a third of the water used in Southern California. Its historic reliability is no longer the case, with continuing findings of contamination of basins and the closing of wells, and the promulgation of more stringent water quality standards, both of State and Federal agencies.

At the same time that our water supply has become, in my opinion, less certain, less reliable than it has in history, we have a tremendous growth in population in Southern California. Actually, a historic growth of historic proportions. We have, of the ten fastest growing counties in all the United States, five are located in Southern California.

We have a population increase currently of 300,000 people a year, that's like adding a city the size of St. Louis or Pittsburgh to Southern California, with its water demand, each and every year. That gives us a great deal of concern. And while this is all the case, we don't have any ostensible substantial support for major new water projects, which of course has been historically the way that we've handled growth.

In light of that, we've turned to what I would call intensified or enlightened water management. How can we make more effective use of existing developed water supplies, and to a great extent we're talking about both the State Project and various Bureau projects. How can we do that?

Well, we turn immediately to the Imperial Valley, the Imperial Irrigation District, which is a California contractor, and it has the lion's share of California's supply of the Colorado River. We've long known, and Bureau reports show it, that lots of water drains to the Salton Sea, is wasted to the Salton Sea, where it can no longer be used, through seepage into earthen canals, through excess drainage, through inefficient irrigation practices.

We approached them with the idea that we pay the many, many millions of dollars to line with concrete those canals, to build regulating reservoirs, to do the on-farm improvements, and many other conservation projects, and we got nowhere.

We finally negotiated, we entered into negotiations only when the State Water Resources Control Board got after them for wasting water in violation of the State Constitution. I regret the Bureau was not a force, a player in this situation. In any case, it took us five years to negotiate an agreement with the Imperial Irrigation District. We signed that early this year. We'll be paying about $115 million over a five-year construction period, and approximately $3 million in operation and maintenance costs yearly, for about 35 years, minimum of 35 years, and we'll be assured of about 100,000 acre feet annually.

There's I think, 200,000 to 300,000 more acre feet annually that can be saved through conservation projects. It's very costly. I don't know how much the farmers can afford, I know they're not interested in paying. We are. We are willing to pay, and we finally negotiated the first increment of what I believe will be several contracts with the Imperial Irrigation District, but we could have used Bureau support, and we look forward for Bureau support in the future.

If there's anything that makes sense, that comports with the new mission of the Bureau, of using its projects more effectively, I would think that we represent a classic initial approach to their making better use of water that is now lost.

Moreover, we in the last session of Congress, sponsored a bill to line portions of the All American Canal, and the Coachella Canal, which are federally owned. Nevertheless, one would think historically that the Federal Government should, out of efficiency, line its canals.

For one thing, though the case Arizona v. California in the Supreme Court ruled that California's reliable supply is 4.4 million acre feet, that doesn't change the fact that the Bureau has outstanding contracts for California agencies for over 5 million acre feet annually. The Bureau should not be relieved of its contractual responsibility merely because of that case. It should adhere to its contracts and at least do everything possible to see that its contracts are fulfilled, particularly in urban areas such as Southern California.

Nevertheless, we've seen no willingness, no interest for the Federal Government to line the All American Canal, the Coachella Canal, those portions that are presently unlined. Metropolitan is now enabled by a legislation of the Congress, the last Congress, to put up the money, it will probably be in excess of $150 million, to do the lining and get about 175,000 to 100,000 acre feet annually that will be conserved.

In addition, we are really funding an experimental program of in-place lining, which we feel will reduce costs of lining canals. In doing so, we're putting up 60 percent of the money currently, and the Bureau something less than 40 percent, and the Coachella Valley Water District a small portion, I believe it's 6 percent.

Ultimately, if this all works out, and the All American Canal portions and the Coachella Canal portions are lined, Metropolitan gets the water, we'll be paying all the costs of even this experimental program, which has now exceeded even the amount that was estimated by the Bureau.

So we're doing what we can, and what we feel the Bureau should be doing, taking a hard look at what's possible to make better use of existing water resources, since there doesn't seem to be support for new ones.

I'll give you an example of one where the Bureau has been helpful, and I'll end it with that, and that's the Arvin-Edison Conservation District in Kern County. Now, there's an agricultural agency, they get CVP water, Central Valley Project water, but it can't take its full contractual amount, because it doesn't have a surface distribution system that's adequate. So it supplies a portion of its land with surface supply, CVP water, and portions with groundwater from its groundwater basin.

Metropolitan has an agreement in principle with that agency, where we'll put up the money to expand, extend, complete their surface distribution system. They can take then all of their CVP water, the amount they need for all their land, and let the groundwater basin remain to be replenished.

Indeed, when there's surplus water on the State Project, we'll deliver it to Arvin-Edison to replenish that groundwater basin. Then in a dry period, we'll ask them to go back to pumping a portion of the waters they need, and they'll give us an exchange amount of their CVP water. And I'm pleased to say that the Bureau and others have cooperated and have been very helpful in this regard.

I close with this. The biggest challenge left, I think, in California, and others have mentioned it, is the Sacramento-San Joaquin Delta. Everyone's unhappy with it, whether it's fisheries people or recreation, or importers of water, both in quantity and quality, and quality is more and more the important thing.

We're all unhappy with it, no one has been able to get together to solve it, because there's an insufficient amount of knowledge about the problems of the Delta, and of course, there has grown up distrust among the contending party.

I think the Bureau can play a big role in both the studies that are necessary and in bringing this all together for a constructive solution—I mean no pun by the word "constructive," because my colleagues in the environmental field don't take to that word well. [Laughter.]

Mr. **Boronkay**. Thank you.

Senator **Bradley**. Thank you very much, Mr. Boronkay, for your testimony.

[The prepared statement of Mr. Boronkay follows:]

STATEMENT OF CARL BORONKAY
GENERAL MANAGER OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
BEFORE THE UNITED STATES SENATE SUBCOMMITTEE ON WATER AND POWER, COMMITTEE ON ENERGY AND NATURAL RESOURCES

AUGUST 29, 1989

Thank you for the opportunity to appear before your committee today to present my views on how federal water policy could be improved to assist in resolving California water resource problems. I have focused my testimony on how reclamation law and Bureau of Reclamation administrative procedures can be modified to help resolve water resource conflicts in California.

Metropolitan was organized in 1928 under the authority of an act of the California Legislature. Metropolitan is one of the largest suppliers of municipal and industrial water in the United States. The District's service area comprises 5,137 square miles and includes the coastal and adjacent areas of the six counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura. Currently, Metropolitan provides about sixty percent of the water needs of the people who live and work within its service area.

Southern California has grown rapidly for the past century. The population in 1930 was about 2.0 million, it is about 14.5 million today and projected to increase to 18.2 million by the year 2010. During the past three years, Southern California's rate of growth has increased dramatically, adding over 1 million people within Metropolitan's service area.

The economy of Metropolitan's service area is exceptionally diverse and vibrant. In terms of gross national or domestic product, it exceeds all but eight nations of the world. The economic stability of the region rests fundamentally upon the importation of a basic resource--water. Importation of water to Southern California was accomplished, initially by the City of Los Angeles from the Owens Valley, then by Metropolitan from the Colorado River, and lastly by development of the State Water Project.

Metropolitan has been an innovator in adopting programs to encourage more efficient use of imported supplies. Although new supplies are clearly needed, Metropolitan has concurrently pursued ways to manage the existing system more efficiently to reduce the need for additional imported water. Outside our service area, Metropolitan has also developed innovative water management programs with agricultural water districts to increase irrigation efficiency and to implement groundwater banking projects. Two examples are the water conservation agreement with Imperial Irrigation District, and the water exchange program with Arvin-Edison Water Storage District. Attached to my testimony is a summary of the activities and programs to increase Metropolitan's dependable water supplies.

LEGISLATIVE AND ADMINISTRATIVE ACTIONS NEEDED TO IMPROVE FEDERAL WATER POLICY

Federal water policy and its implementation is important to Metropolitan because of our contract with the United States for Colorado River water and our contract with the State of California for water from the State Water Project (SWP). Federal water policies and their implementation directly affect the SWP because the SWP and the Federal Central Valley Project (CVP) both export water from the Sacramento-San Joaquin Delta (Delta) and share facilities such as San Luis Reservoir and some reaches of the California Aqueduct.

Coordinated Operation of CVP and SWP

Cooperation between the Bureau of Reclamation and the Department of Water Resources and coordinated operation of the CVP and SWP are critical elements in the sound and effective management of water supplies flowing into, flowing out of and being diverted from the Delta. The CVP is the largest water project in the State and plays a major role in almost all of the issues related to the San Francisco Bay and Delta estuary. Without the cooperation of the Federal Government, the following Bay/Delta issues cannot be adequately addressed: (1) water quality protection for San Francisco Bay and the Delta; (2) protection of CVP and SWP export water quality and firm water supplies; (3) CVP and SWP (and other upstream diverters) impacts on Delta and Suisun Marsh fish and wildlife resources; (4) Delta levee rehabilitation and protection; (5) San Joaquin Valley agricultural drainage, (6) south Delta water quality and water level problems, and (7) protection of the Delta-Mendota Canal from unrestricted discharge of agricultural wastes.

Congressional authorization in 1986 (P.L. 99-546) of the Coordinated Operation Agreement (COA) between the Bureau of Reclamation and the California Department of Water

Resources (DWR), dated May 20, 1985, was a key step toward federal and state cooperation. The COA allocates the responsibility for maintaining Delta water quality between the CVP and the SWP. Without such an agreement, there can be no assurance the CVP will be operated to maintain the necessary water quality in the Bay/Delta estuary.

A key provision of the COA is Article 10(h), which provides for the negotiation of an agreement for the purchase of CVP water by the State of California for the SWP and for wheeling of CVP water to federal contractors through SWP facilities. Such an agreement is of value to both projects since the SWP currently has excess transportation capacity but has an inadequate water supply. The Bureau of Reclamation and DWR negotiators currently estimate that about 250,000 acre-feet of CVP water would be available to the SWP for the next 20 years. The CVP has sufficient water supplies but lacks the transportation capacity to export water from the Delta. The 10(h) agreement between the Bureau of Reclamation and DWR will require Congressional approval. Approval of this agreement is important because, at its current level of development, the SWP has a firm water supply of about half the 4.2 million acre-feet of maximum entitlement obligations. The project can just barely meet current orders for water. If Metropolitan is unable to pump Colorado River water at its full aqueduct capacity, its demand for SWP water will increase significantly. Without the 10(h) water purchases from the CVP the potential shortages on the SWP will be even greater.

Resolving Delta Problems

The greatest opportunity for mutually beneficial cooperation between California's environmental and water development interests is the Delta. The Delta is a critical California water issue. Many millions of federal and State dollars have been spent on scientific studies and engineering reports on alternative plans to solve Delta problems. However, reaching consensus on a plan to solve Delta problems has been elusive.

During the past 150 years, a number of complex events have impacted the quality of water and the fish and wildlife resources of the San Francisco Bay-Delta estuary. Water exports are just one of a number of factors. It is well-understood today that the status quo in the Delta is unacceptable to all interests. Fisheries continue to suffer. Water quality has degraded. Delta channels scour, export capabilities are limited, and precious stored water supplies are wasted.

The present operation of the State and federal pumping plants in the Delta is an unacceptable situation for everyone interested in protecting Delta values and meeting the water needs of more than two-thirds of the people of the State. Construction of Delta transfer facilities and modification of pumping plant operations would move us a long way toward resolving all of these problems.

Resolving fishery and waterfowl issues in the Delta and upstream will require the cooperation and coordination of many federal and state resource agencies. Within the Department of the Interior, the Fish and Wildlife Service, Bureau of Reclamation, and Geological Survey have important roles. In addition, the Army Corps of Engineers, Environmental Protection Agency, and the National Marine Fisheries Service also have significant responsibilities with regard to Central Valley fishery and waterfowl management.

A successful example of cooperation and coordination was the Congressional authorization (P.L. 99-546) of the Suisun Marsh Agreement. Suisun Marsh is the largest habitat in California for the Pacific flyway. The agreement, among the Bureau of Reclamation, California Departments of Fish and Game and Water Resources, and the Suisun Resource Conservation District, provides for the construction of facilities to maintain water quality within Suisun Marsh. Funding was cost-shared among the State of California and federal CVP and SWP water contractors.

Current negotiations are under way to implement Delta fishery management programs including a comprehensive Central Valley salmon management plan mandated by the California Legislature (S.B. 2261). Although these negotiations are not completed, it is important that the federal agencies actively participate to ensure successful implementation. Undoubtedly, Congressional action, including the appropriation of the federal share of the costs, will be required to implement at least a portion of these agreements.

Delta Drinking Water Quality

Delta water quality is vulnerable to degradation from many sources, including sewage and industrial waste discharges, seawater intrusion, agricultural wastewater within and upstream from the Delta, urban stormwater runoff and recreational activity. This vulnerability is of critical concern to public agencies who export water from the Delta to supply drinking water to two-thirds of the state's population.

Delta water quality is routinely monitored for all substances for which drinking water quality standards have been established under State and federal law. Treated Delta water currently meets those standards. Concentrations of organic chemicals in the Delta and its tributaries, are lower than existing limits established in state and federal drinking water quality standards.

Constant monitoring for organics in the Delta and in the export systems is necessary because of its vulnerability to organic degradation. For example, certain natural organic compounds that can combine with chlorine used for drinking water disinfection to form trihalomethanes (which are suspected carcinogens) have been found in the Delta at elevated levels. Many public agencies relying on Delta water have changed their treatment methods to assure public health protection and to comply with federal and State drinking water quality standards. Additional treatment or improved processes will be required in the future, as new standards are adopted and greater concentrations of contaminants are detected in Delta water.

Although treatment methods may be available to reduce or eliminate a particular contaminant, the cost-effective approach is to protect the water supply from the contaminant. Such is the case with the potential for degradation of the San Joaquin River by irrigation runoff and agricultural subsurface drainage. Although no data indicate that runoff and agricultural drainage being released into the San Joaquin River presently threaten drinking water supplies, continued discharges into this water source are reason for concern. This situation, which is more fully addressed in the following section of this paper, must be carefully evaluated in the context of the potential risks to public health.

While present operational practices assure acceptable water quality for export use of Delta water by California residents, efforts to strengthen protections for existing water supplies and to improve water quality in the future should continue. Any Delta improvement program must recognize the significance of the Delta as a source of drinking water for most of the State's residents, and care must be taken not to foreclose physical options that may ultimately prove to be in the interest of public health protection. To address the problems and issues related to protecting Delta drinking water quality, nine Bay Area and Southern California water agencies funded a study to evaluate options for improving drinking water quality. I have included a copy of the report with my written testimony.

Colorado River

Metropolitan was organized in 1928 to provide Colorado River water to the coastal plain of Southern California. This was the same year that Congress authorized the Boulder Canyon Project Act which provided for the construction of Hoover Dam and approved the Colorado River Compact. In 1930, Metropolitan executed contracts for the repayment of a significant share of the construction costs of Hoover Dam and the delivery of Colorado River water to the coastal plain of Southern California. Metropolitan is the largest Bureau of Reclamation water contractor (approximately 1.3 million acre-feet) for municipal and industrial water supply in the western United States. However, with the commencement of deliveries to the Central Arizona Project in 1985, Metropolitan's dependable Colorado River supplies were reduced by more than half (equivalent to about one-third of Metropolitan's current water sales). Annually, the Secretary of the Interior determines whether Metropolitan can divert Colorado River water in excess of California's basic apportionment of 4.4 million acre-feet. Federal water policy should be targeted at ensuring that these potential shortages of Colorado River supplies to Metropolitan be avoided to the maximum extent practicable.

To reduce Metropolitan's loss of dependable Colorado River supplies, Congress enacted S.795 last year, which will allow Metropolitan to finance the lining of the federal All American Canal to reduce seepage losses by 100,000 acre-feet annually. In addition, Metropolitan is working to implement a landmark water conservation agreement with the Imperial Irrigation District which will conserve an additional 100,000 acre-feet annually. Metropolitan is seeking to develop additional conservation programs with the agricultural districts in California who use Colorado River water. The continuing active support of the Department of the Interior (and the Bureau of Reclamation) in implementing these conservation measures will be important.

THE BUREAU OF RECLAMATION'S NEW MISSION

Metropolitan supports the new mission initiatives of the Bureau of Reclamation. In California, the new mission programs of resolving water quality and environmental problems, implementing groundwater management programs, enhancing fish and wildlife resources, and improving the operational efficiency of existing water projects like the CVP/SWP 10(h) agreement are key elements to meeting the future water needs of the State.

The Bureau and Metropolitan have been working cooperatively together in implementing the Bureau's new policy of facilitating water transfers and exchanges. An example is the implementation of an innovative water storage and exchange program with the Arvin-Edison Water Storage District, a CVP agricultural contractor. Metropolitan and Arvin-Edison have received excellent cooperation from Bureau staff. The Bureau staff is helping to facilitate and resolve the daunting number of issues associated with the Arvin-Edison program by giving it a high priority and assigning qualified staff that have been helping to solve problems in a creative and positive manner.

In California during the past few years there has been much discussion about transferring water from agricultural areas to urban areas. Water transfer and exchanges in California are institutionally and legally complex because of the enormous number of federal and State laws, overlapping governmental jurisdictions, and the variety of water rights and contractual agreements for water service. Our experience is that the best approach is to work cooperatively with agricultural water districts on projects that increase water use efficiency and better utilize existing conveyance and storage facilities (e.g., groundwater banking). In this way, both agricultural and urban areas benefit.

California and the other Colorado River Basin states have a partnership with the Bureau in funding Colorado River salinity control projects. In accordance with the Clean Water Act, numeric criteria have been set for salinity below Hoover and Parker Dams and at Imperial Dam. Meeting the criteria will require continued Congressional appropriations for the salinity control program to be implemented.

Other examples of the implementation of the Bureau's new mission programs in Southern California are:

1. The Coachella Canal in-place lining prototype project;
2. The development of an innovative water quality management program for the Santa Ana River watershed; and
3. The cooperative investigation with the Colorado River Board of California of the East Mesa groundwater banking project.

RECOMMENDATIONS TO THE COMMITTEE

From my perspective, as General Manager of Metropolitan, I would suggest the following water policy issues be reviewed by your Committee.

(1) The highest priority in the near future will be the Congressional authorization of the COA 10(h) agreement which will provide an interim water supply to the SWP.

(2) Also of critical importance will be the Congressional authorization and appropriations for implementing negotiated agreements to improve fishery and waterfowl habitats of the Central Valley.

(3) Improvement of Delta drinking water quality will be an increasingly important issue in the future. Congressional oversight of the CVP and possible measures to improve Delta drinking water quality should be considered.

(4) Congressional policy and Bureau of Reclamation procedures should be reviewed to ensure that increased agricultural irrigation and urban water use efficiency is an important priority in managing federal water projects and supplies to your contracted users. For example, Metropolitan's Board of Directors supports the Fowler/Atkins Congressional legislation (S. 583, H.R. 1185) mandating low-flush toilets, low-flow shower heads, and other water conserving plumbing standards.

(5) With regard to the Colorado River, Bureau of Reclamation administrative procedures should to the maximum extent practical have as a goal fulfilling Metropolitan's delivery request of approximately 1.3 million acre-feet annually. Bureau of Reclamation budgeting priorities should recognize the importance of adequate and timely funding of the federal share of Colorado River salinity control projects.

Mr. Chairman, again thank you for the opportunity to testify and I am available to answer any questions you may have.

A SUMMARY OF THE ACTIVITIES TO INCREASE METROPOLITAN'S DEPENDABLE WATER SUPPLIES

August, 1989

The Metropolitan Water District
of Southern California

A Summary of the Activities to Increase Metropolitan's Dependable Water Supplies

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August, 1989

A Summary of the Activities to Increase Metropolitan's Dependable Water Supplies

Future Water Needs

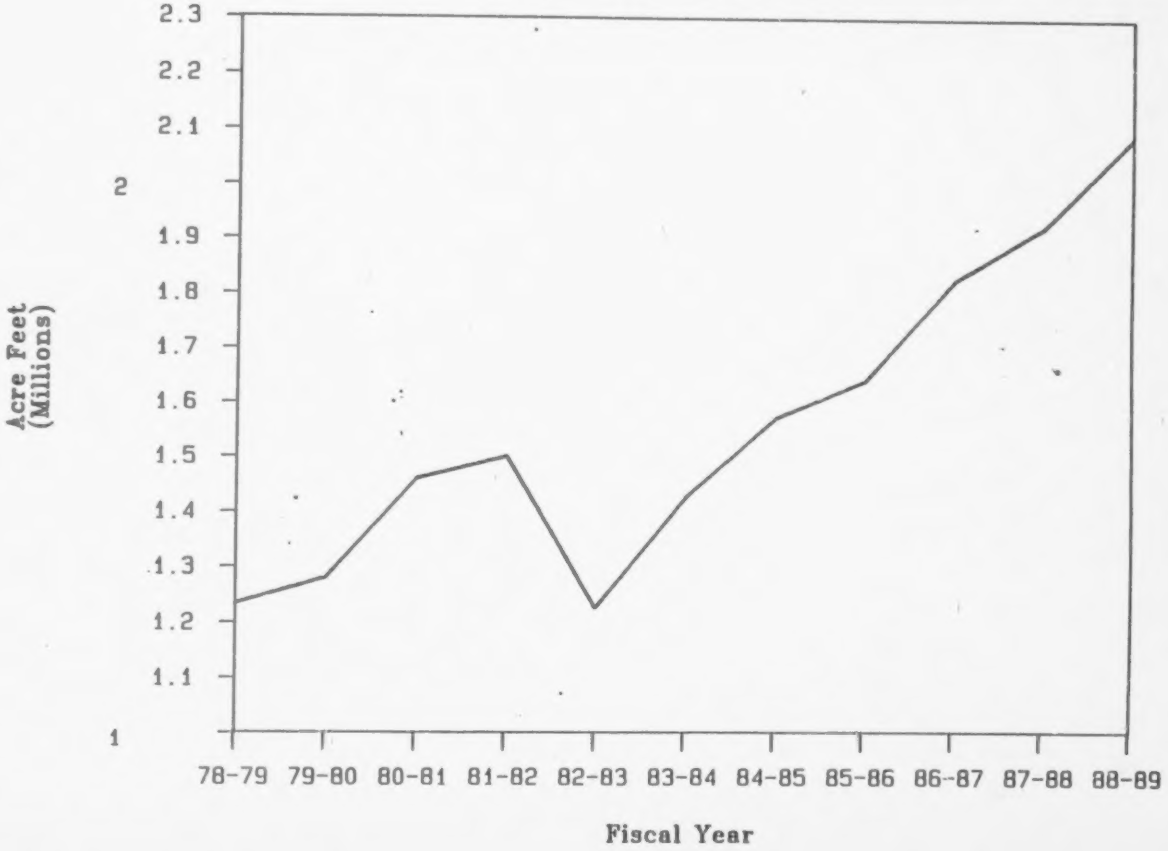
Roughly two-thirds of the total water used in The Metropolitan Water District of Southern California (Metropolitan) service area is imported water, received by the City of Los Angeles through the Los Angeles Aqueducts and by Metropolitan through the Colorado River Aqueduct and the State Water Project (SWP). The balance, representing slightly more than one-third of the total supply, is produced locally, primarily from groundwater.

In Metropolitan's service area during the last several years, natural population growth and net in-migration added more than 300,000 new residents annually. This represents an increase in water demands during each year that exceeds the total water demands of cities the size of Miami, Cincinnati, Pittsburgh, or St. Louis. Population growth in the service area over the next 20 years (2010) is projected to increase from 14.5 million to 18.2 million.

The overall demand for Metropolitan's imported water has increased dramatically (see Figure 1). Due to unseasonably warm weather and population growth, water sales in 1987-88 set a record of 1.92 million acre-feet, surpassing the previous year's record of 1.82 million acre-feet. However, the recently ending fiscal year, 1988-89, exceeded all sales records in 9 out of 12 months with a total sales volume of 2.09 million acre-feet.

Projected total water demand within Metropolitan's service area for the year 2000 is approximately 3.9 maf and for the year 2010 is approximately 4.4 maf. However, current dependable supplies (including LA Aqueduct and local supplies) for Metropolitan's service area are only about 3.3 million acre-feet. As such, there is a potential shortfall of 600,000 acre-feet in the year 2000 increasing to

Figure 1
Historic Metropolitan Water Sales



1.0 million acre-feet in the year 2010. This is the reason for Metropolitan pursuing, in conjunction with other water agencies, the activities summarized in this report to develop new water supplies to augment the current dependable Colorado River and State Water Project supplies and to implement new water management programs to maximize the use of the available imported water supplies.

Colorado River Water Supplies

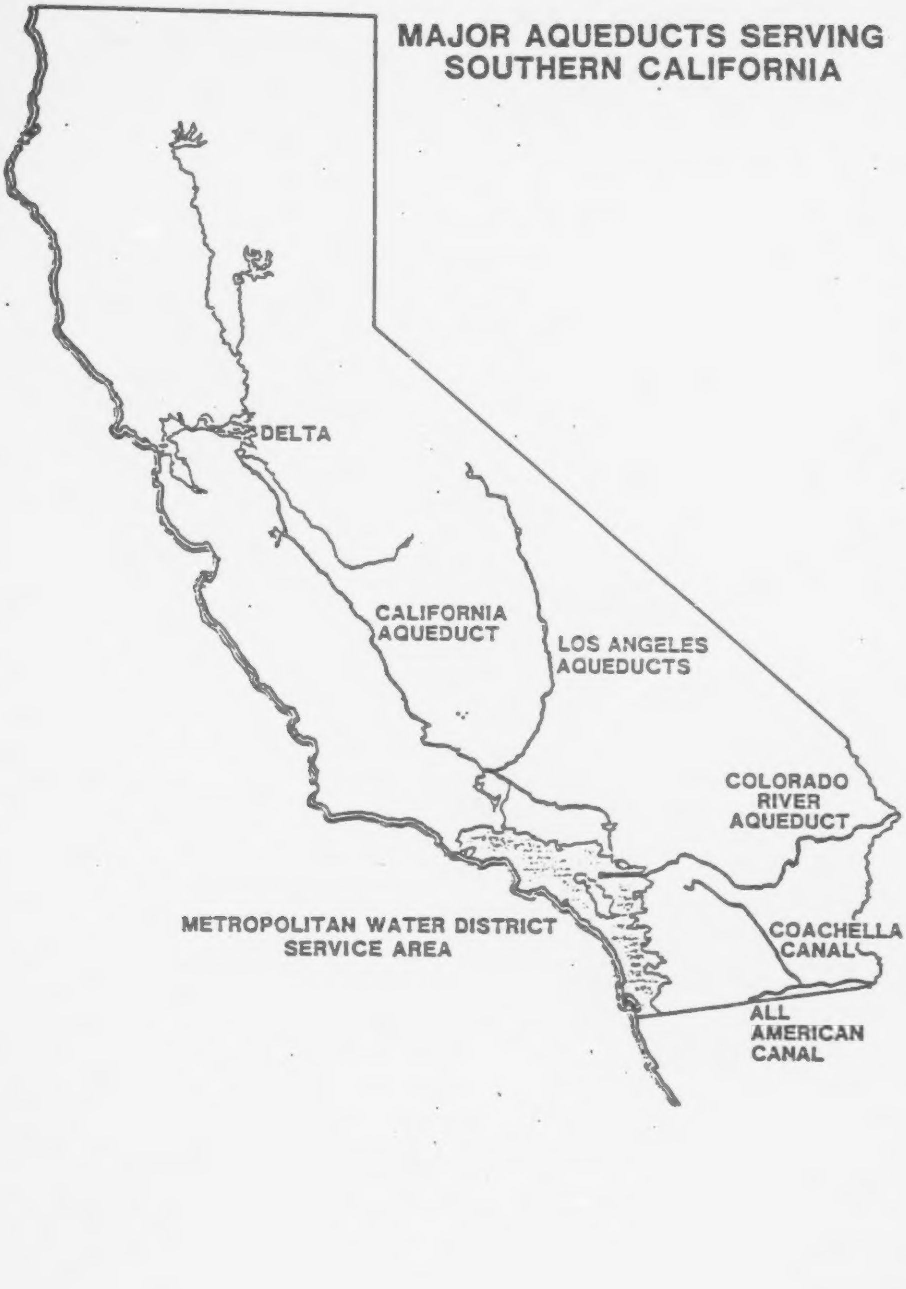
The Colorado River Aqueduct, owned and operated by Metropolitan, transports water from the Colorado River 242 miles to its terminus at Lake Mathews in Riverside County (see Figure 2).

In 1930, Metropolitan contracted with the United States for 1,050,000 acre-feet of water annually from the Colorado River. A supplementary contract in 1931 increased Metropolitan's allotment to 1,100,000 acre-feet per year. The annexation of the San Diego County Water Authority in 1946 resulted in an increase in Metropolitan's allotment to 1,212,000 acre-feet per year. In 1987, Metropolitan executed another contract with the Bureau of Reclamation for surplus water from the Colorado River.

California's use of Colorado River water is allocated to certain California water agencies and the Bureau of Reclamation Yuma Project by the 1931 Seven-Party Agreement, the priorities of which have been incorporated in the several water delivery contracts between the Secretary of the Interior and the California water agencies. The Seven-Party Agreement establishes the priority that each contractor has to divert Colorado River water under California's apportionment. Certain agricultural entities have the first three priorities to use 3.85 million acre-feet annually from California's entitlement.

Metropolitan currently diverts water from the Colorado River under its fourth priority right of 550,000 acre-feet per year and its fifth priority right of 662,000 acre-feet per year. Arizona began its diversion of Colorado River water for the Central Arizona Project (CAP) in 1985. Congress, in authorizing the CAP in 1968, directed the Secretary of the Interior to develop operating criteria for the Colorado River. Under the criteria, the Secretary has approved California's use of more than 4.4 million acre-feet in 1986, 1987, 1988, and 1989. California's total diversions could be restricted to the first four priorities totalling 4.4 million acre-feet per year in accordance with the United

FIGURE 2


MAJOR AQUEDUCTS SERVING SOUTHERN CALIFORNIA
DELTA
CALIFORNIA AQUEDUCT
LOS ANGELES AQUEDUCTS
COLORADO RIVER AQUEDUCT
METROPOLITAN WATER DISTRICT SERVICE AREA
COACHELLA CANAL
ALL AMERICAN CANAL

States Supreme Court decree in Arizona v. California. At such time, Metropolitan's diversions could be limited to its fourth priority right, plus any water left unused by another California contractor with a higher priority to use of California's apportionment, minus diversions by certain California Indian reservations. Between 1982 and 1988, the agricultural entities with the first three priorities used less than their full entitlement. However, it is projected that the agricultural entities may use more than 3.85 million acre-feet in 1989.

Metropolitan has entered into an agreement with the Imperial Irrigation District and is seeking agreements with other California users to reduce diversions from the Colorado River on a long-term basis, thereby augmenting Metropolitan's available supply. The potential conservation savings with the agricultural entities is substantial, approximately 250,000 to 400,000 acre-feet. In addition to the potential supply available to Metropolitan from the agricultural entities, the Secretary of the Interior could allow Metropolitan to divert water unused by Arizona or Nevada. In years of surplus flows on the Colorado River, California is also entitled to divert up to one-half of the surplus, and Metropolitan would have the highest priority of any California contractor to divert these surplus flows by virtue of its fifth priority right. In times of shortage, California's 4.4 million acre-foot entitlement would be met before allowing diversions by the Central Arizona Project.

Imperial Irrigation District Water Conservation Agreement. A landmark water conservation agreement was signed earlier this year by one of the largest irrigation districts in the United States, the Imperial Irrigation District (IID) which is a California contractor for Colorado River water and Metropolitan. In brief, the IID/MWD Agreement provides for Metropolitan to bear the capital and indirect costs of specific conservation projects. The agreement provides for a five-year construction period and a minimum term of 35 years thereafter. Metropolitan will pay the actual costs for construction of facilities during the next five years, estimated to total $92 million (1988 dollars), a total of $23 million during that same period for indirect costs, and the actual costs for operation, maintenance and replacement estimated to total $3.1 million per year (1988 dollars) through the year 2028. In return, Metropolitan will be entitled to divert from the Colorado River a quantity of water equal to the amount of conserved water that will be saved by these projects, of approximately 100,000 acre-feet annually upon full implementation. The program calls for structural and non-structural conservation measures, including projects to line existing irrigation canals, construct local reservoirs, and install gates and automation equipment. It is anticipated that all projects will be completed by January 1, 1994. If the conserved water cannot be diverted by Metropolitan in a particular year, storage of the conserved water in a reservoir such as Lake Mead would be subject to the negotiation of a separate storage agreement. After the Colorado River Basin demands exceed the average annual river runoff, the Colorado River reservoirs will be gradually drawn down leaving vacant storage space in Lake Mead. Metropolitan would not obtain a cumulative right to conserved water if it could not be diverted or stored. The water expected to be conserved under this agreement will meet the residential needs of about a million people in Metropolitan's service area.

Metropolitan is currently pursuing approval of the IID/MWD Agreement with the Coachella Valley Water District (Coachella) and the Palo Verde Irrigation District. Coachella has challenged the IID/MWD Agreement in federal court because Coachella representatives believe their agency would be damaged by the IID/MWD Agreement. In its complaint, Coachella alleges that the conservation agreement would cause Coachella to lose 100,000 acre-feet of water in the event that there was not enough water to meet all the needs of the Colorado River agricultural users in California. Metropolitan has not responded yet to the complaint because the parties are continuing to discuss and attempt to resolve Coachella's concerns. Coachella has agreed to give the parties an extension of time to respond and its Board of Directors has adopted a set of principles which if implemented would allow dismissal of the complaint. MWD and IID representatives are discussing the manner in which the principles could be implemented.

Lining of the All American and Coachella Canals. In November 1988, the President signed S. 795 into law. Title I of Public Law 100-675 provides for the settlement of the reserved water rights claims of the La Jolla, Rincon, San Pasqual, Pauma, and Pala Bands (Bands) of Mission Indians in San Diego County. Title II authorizes the Secretary of the Interior to line the All American Canal from Pilot Knob to Drop 4 and the Coachella Branch from Siphon 7 to Siphon 32 and to enter into agreements with Metropolitan and other California contractors for Colorado River water to fund the lining projects. The canals are owned by the United States. About 100,000 acre-feet of water a year now lost to seepage in unlined portions of the canals could be saved by these projects and made available for use in urban Southern California through Metropolitan's delivery system.

The provisions of Title II provide that Metropolitan would finance up-front one hundred percent of the construction costs of the lining project to conserve seepage from the All American Canal. The Bureau of Reclamation is preparing the environmental studies of the impacts of both the All American Canal and Coachella Branch lining projects. Two draft environmental impact statements are scheduled to be completed in September 1990. Imperial, Coachella, and Metropolitan are participating in the study process.

To provide a supplemental water supply for the benefits of the Bands and Escondido and Vista Irrigation District, the Secretary is directed by Title I to arrange for the development of 16,000 acre-feet of water annually. This water can be developed from public lands outside the CVP service area or through lining of the All American Canal. In either case, a water delivery contract will be needed with Metropolitan.

Coachella Branch Prototype Project. In place lining of a 1 1/2 mile section of the Coachella Branch while water is flowing through the canal was initiated in the spring of 1989 to test this new innovative construction. The Bureau of Reclamation, Coachella, and Metropolitan are providing the funding for this prototype project. Kiewit Pacific Company, the contractor for the project shaped the canal prism and began to apply a geotextile polyvinylchloride liner and concrete cover earlier this year. Work on the project was suspended for the summer, due to problems with the contractor's construction equipment. Work is expected to be completed this fall. The prototype project will allow for refinement of cost estimates, evaluation of environmental impacts, and verification of equipment operation. A technical report evaluating the in-place lining technology is scheduled for completion in early 1990.

East Mesa Groundwater Storage Project. The East Mesa is located in the easterly portion of Imperial County and is predominately federal public and, administered by the Bureau of Reclamation. The Colorado River Board of California and the Bureau of Reclamation have been conducting feasibility studies of recharging the East Mesa groundwater basin with surplus Colorado River. The concept of this storage and recovery project would be to bank surplus Colorado River water for later use by Imperial, Coachella, or Metropolitan when the California contractors would be short of Colorado River water. Coachella and Imperial could take delivery of the pumped groundwater in lieu of direct Colorado River diversions, thereby providing additional Colorado River water to Metropolitan.

During the winter of 1989, surplus Colorado River water was percolated into the East Mesa groundwater basin. Additional monitoring wells are being drilled by the Bureau of Reclamation to evaluate the feasibility of recovering the stored water.

State Water Project

Metropolitan's second source of water is the SWP, which is owned by the State and operated by DWR. This project transports water from the Sacramento-San Joaquin Delta via the California Aqueduct to four delivery points near Metropolitan's northern and eastern boundaries. The total length of the California Aqueduct is 444 miles.

Metropolitan is one of 30 agencies which have contracts for water service with the State, but is by far the largest in terms of number of people it serves, the quantity of SWP water to which it is entitled (48 percent), and the total amount of payments it makes to the State (70 percent).

As currently developed, and under current Delta outflow standards, the SWP has a project yield during dry periods of approximately 2.4 million acre-feet per year. The total requests for water from the SWP in 1988 were 2.6 million acre-feet and increased to 2.9 million acre-feet for 1989. The total maximum contractual entitlement of the 30 SWP contractors is 4.2 million acre-feet per year.

In recent years, Metropolitan has been able to divert about 1.2 million acre-feet from the Colorado River. As Metropolitan's water demands increase and the quantities of available Colorado River water decrease, the probability of deficiencies on the SWP will increase rapidly unless the SWP dependable supplies are also increased.

In dry or drought years, the supply from existing SWP facilities would not meet projected demands. Therefore, it is important to Metropolitan that the yield of the SWP be augmented. Metropolitan is encouraging the State to continue development and completion of acceptable short- and long-range means of producing the additional water supplies that will be needed in the future. One promising solution is the interim purchase from the federal Central Valley Project

(CVP) of approximately 250,000 acre-feet per year. Such water is currently projected to be available in diminishing amounts through the year 2020. Other long-term solutions include the ongoing installation of four additional pump units at the Harvey O. Banks Delta Pumping Plant, widening and deepening of some Delta waterways, and construction of new storage facilities south of the Delta to store winter runoff (Los Banos Grandes Reservoir and Kern Water Bank).

In January, 1988, the Department of Water Resources published its latest update of the California Water Plan (DWR Bulletin 160-87). Included in the Water Plan was a description of a comprehensive program to increase the SWP yield from 2.4 million acre-feet per year to 3.2 million acre-feet per year by the year 2010. The projected state contractors' demands by the year 2010 are 4.15 million acre-feet per year. The projects in the comprehensive program were:

1) Construction of four additional units at the Delta Pumping Plant;

2) Construction of Delta improvements in the South Delta to allow the pumping plant to be operated at full capacity;

3) Construction of Delta improvements in the North Delta to reduce the reverse flows in the lower San Joaquin River and the carriage water losses to San Francisco Bay;

4) Implementation of an interim purchase agreement of approximately 250,000 acre-feet per year of federal CVP;

5) Construction of an offstream reservoir, Los Banos Grandes, to store surplus Delta water during the winter months; and

6) The implementation of the Kern Water Bank groundwater storage and recovery project.

Groundwater Storage Programs Outside Metropolitan's Service Area

Desert Water Agency/Coachella Valley Water District. Metropolitan has agreements with Desert Water Agency (Desert) and Coachella to exchange a portion of its Colorado River water for these agencies' SWP entitlements. Metropolitan also has an agreement that permits advance delivery of Colorado River water to Desert and Coachella for storage in the Coachella groundwater basin. In later periods the overlying agencies would draw on the stored water and Metropolitan would use all of its Colorado River water and those agencies' SWP entitlements. By May 1, 1987, Metropolitan had stored 552,000 acre-feet of water under this agreement. Since that time Metropolitan has interrupted deliveries because of the dry conditions during 1987-89, reducing water in storage by 87,000 acre-feet leaving approximately 430,000 acre-feet in storage as of mid-year 1989.

Arvin-Edison Water Storage District. The Arvin-Edison Water Storage District (Arvin-Edison), a CVP contractor in Kern County, as part of its ongoing water resources management program, has developed with Metropolitan a proposal for a groundwater storage and exchange program. Arvin-Edison, through exchange agreements with other irrigation districts in the San Joaquin Valley, has a contract for CVP water that is delivered from the California Aqueduct. Under the proposed program Metropolitan would exchange a portion of its SWP supplies in the short term for part of Arvin-Edison's federal CVP supplies in the long term.

When Metropolitan has sufficient water available from the SWP when there are no impacts on other State contractors, it could make a portion of that water available to Arvin-Edison for direct and indirect deliveries into groundwater storage. During dry years, Arvin-Edison would make water available to Metropolitan from its federal CVP supplies, and would supply its farmers with water previously stored underground by Metropolitan. Based on a feasibility study, Metropolitan could store up to 135,000 acre-feet per year. A storage account of up to 800,000 acre-feet could be accumulated by Metropolitan. This program would provide a dependable yield of 93,000 acre-feet per year, under 1928 to 1934 dry period conditions.

Storage Management Programs

The groundwater basins in Southern California are among the best managed basins in the world. Metropolitan has contributed to the effective management of these resources by offering water for groundwater replenishment at lower rates. Metropolitan is also seeking to promote conjunctive-use programs that integrate the management of imported surface water supplies with storage in Southern California's groundwater basins and surface reservoirs. Metropolitan, in cooperation with its member agencies, is presently investigating the opportunity for conjunctive-use programs in over a dozen Southern California groundwater basins. Such programs would use supplemental water available in the winter ~~months~~ from the SWP or the Colorado River that would recharge local groundwater basins. As an additional element of these programs, local purveyors would take imported surface water deliveries in-lieu of pumping, thereby raising groundwater levels. The stored groundwater could be combined with other local supplies for use during the dry summer months or during droughts.

Interruptible Program. Metropolitan in 1981 adopted the Interruptible Program to provide an incentive for member agencies and their subagencies to bank water for use during a shortage of imported supply. The Interruptible Program encourages member agencies to maintain local water reserves in either surface reservoirs or groundwater basins, so that a portion of their demands on Metropolitan can be interrupted during a water shortage without affecting service to their domestic and municipal retail customers. By discontinuing these deliveries in times of future shortages, Metropolitan's available water supply can be delivered to member agencies that have domestic and municipal demands which cannot be served from an alternative source of supply.

Seasonal Storage Service. On July 11, 1989, Metropolitan's Board of Directors adopted a new water rate class of service to encourage more efficient operation of the local storage facilities with the import system. The objectives of the program are to:

- Maximize the capability for Metropolitan to import additional water when available, thereby increasing the supply from the SWP and Colorado River;
- Increase member agency production of local water during peak-demand periods to enhance the ability to regulate flows on Metropolitan's aqueduct and distribution facilities, and lessen the seasonal drawdown of Metropolitan's storage reserves; and
- Increase member agency production of local water during droughts, making additional imported supplies available for member agencies that do not participate directly in the program.

Eastside Reservoir. In addition, Metropolitan has initiated a comprehensive feasibility study of constructing a new (or enlarging an existing) terminal surface reservoir in Riverside County. The engineering feasibility and environmental assessment studies are evaluating five alternative reservoir sites that would provide an additional 300,000 to 1,000,000 acre-feet of surface reservoir storage to increase Metropolitan's seasonal, drought, and emergency storage reserves to meet the projected increase in water deliveries.

Wastewater Reuse and Reclamation

Southern California is a leader in wastewater reuse and reclamation projects with 38 existing or under construction by local agencies in Metropolitan's service area. With Metropolitan's and member public agencies' participation, it is expected that these projects will ultimately deliver approximately 189,400 acre-feet per year of reclaimed water for landscape irrigation, groundwater recharge, and industrial use.

Local Project Program. Metropolitan promotes wastewater reuse and reclamation through its Local Projects Program. Under the program, Metropolitan provides financial assistance to local projects which develop new water supplies. The program's primary focus is on increasing the use of reclaimed water for landscape irrigation and industrial purposes, thereby reducing the demand for potable water supplies. To date, Metropolitan has participated financially in 12 of the 38 projects mentioned above, with a total ultimate yield of 35,650 acre-feet per year. Currently, 14 additional projects submitted to Metropolitan for inclusion in the program are in various stages of review. These proposed projects have a combined estimated ultimate yield of 31,721 acre-feet per year.

Demand Reduction and Water Conservation Programs

Conservation programs will play a significant role in meeting future water needs. At the present time, existing conservation programs are estimated to be saving approximately 200,000 acre-feet annually in Metropolitan's service area. By 2010, Metropolitan's conservation objective is to raise water savings to 450,000 acre-feet annually. To achieve this objective, Metropolitan has implemented a wide variety of conservation programs.

These programs, listed on Table 1, include education and public information, plumbing fixture retrofit, pricing, audits to promote conservation by large water users, research, improvements in distribution system management, and others.

In August 1988, Metropolitan established the Conservation Credits Program which uses economic incentives to encourage the development of water conservation programs by our member agencies and other water retailers in Southern California. Under the Conservation Credits Program, Metropolitan will pay a "conservation credit" to participating agencies that adopt conservation programs with verifiable water savings. Currently, the amount of the payment from Metropolitan equals either energy savings from reduced water imports due to the program or one-half of program costs, whichever is less.

Energy savings attributable to a program are based on the costs of pumping water through the California Aqueduct, subject to a $75 per acre-foot minimum. Participating agencies must demonstrate that the financial contribution from Metropolitan is necessary for the implementation of the proposed project.

Metropolitan intends to encourage a variety of water conservation practices with the Conservation Credits Program. For example, a joint effort with the City of Pasadena will result in the retrofit of residential bathroom devices, replacing high-flow showerheads with low-flow showerheads and installing toilet dams, to reduce water usage in the bathroom where 65 percent of residential indoor use occurs.

A $2.4 million project was recently undertaken jointly with the City of Santa Monica to replace existing toilets, which may use between 3.5 and 8 gallons per flush, with the new ultra-low-flush toilets, requiring only 1.6 gallons per flush. Participating households in Santa Monica will receive a $100 rebate for each bathroom retrofitted. Nonparticipating households will pay a surcharge of $0.50 per bathroom per month to help finance the program.

Other proposals under the Conservation Credits Program would: (a) reduce water use by large-scale turf irrigation systems, (b) implement major leak detection and repair programs, (c) conduct residential and commercial water audits to teach water savings techniques, and (d) develop other conservation approaches.

TABLE 1

WATER CONSERVATION PROGRAMS IN THE SERVICE AREA OF
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

I. Education and Public Information	
A. Elementary Schools	In-school education program for fourth and sixth grades to teach pupils to use water wisely. Other programs as requested.
B. High Schools and Colleges	Oral presentations and literature designed to promote water conservation.
C. Public Information	Nine separate activities to disseminate water conservation information.
D. Media Campaign	Annual major media campaign to encourage water conservation.
II. Promotional Measures	
A. Landscaping	
1. Literature, Films, and Speakers Bureau	Dissemination of information concerning low-water-use plants.
2. Demonstration Garden	A low-water-using demonstration garden at Metropolitan's headquarters building in Los Angeles
3. Work with Nurseries	Distribution of literature to encourage low-water-using landscaping.
B. Water Saving Devices	Distribution of low-water-use devices to retrofit existing plumbing fixtures.
C. Work with Large Water Users	Work with large water users to encourage the use of low-water-using equipment.

D. Work with Other Agencies	
1. State Agencies	Work with the Department of Water Resources to develop and coordinate programs.
2. Member Agencies	Coordinate water conservation activities with those of the member agencies.
3. Other Organizations	Coordinate water conservation activities with those of other organizations.
4. Conferences and Forums	Participate in conferences and forums which promote water conservation.
III. Distribution System Management	
A. Water Audit	Perform weekly and monthly detailed water audits on entire distribution system.
B. Metering	Meter all water entering and leaving distribution system.
C. Meter Maintenance and Calibration	Meters checked, lubricated and calibrated every three months; complete maintenance and calibration every 12 months.
D. Corrosion Control	Extensive on-going corrosion control program to protect facilities and test chemicals and materials to determine their resistance to corrosion.
E. Valve Exercising	Valves maintained and exercised every six or 12 months depending on size.
F. Leak Detection	Part of routine maintenance. Also consultants are hired periodically to detect and repair leaks throughout distribution systems.
IV. Financial Incentives	
A. Conservation Credits	Provides financial payments, up to 50 percent of total costs, for implementation of conservation programs with verifiable water savings.

Senator **Bradley**. And now Mr. Georgeson.

STATEMENT OF DUANE L. GEORGESON, LOS ANGELES DEPARTMENT OF WATER & POWER

Mr. **Georgeson**. Good afternoon, Mr. Chairman and Congressman Fazio. If I might provide the members of the Committee with a couple of exhibits, it might aid in getting through a quicker presentation.

I'd like to take a few minutes to talk about a related water controversy that the City of Los Angeles is involved with. The map which I've passed out will aid you in understanding how the Mono Lake water issues fit in with the Central Valley Project issues that we've been talking about the majority of today.

As you can see in the small map in the lower left-hand corner, there's the Los Angeles Aqueduct in the eastern Sierra, which the City of Los Angeles constructed initially around the turn of the century, completed in 1913. Dave Kennedy this morning, I understand, referred to the fact that the City of Los Angeles engaged in a sizeable water marketing exercise, buying a lot of ranch land, in order to acquire the water rights to that project.

That project was extended northerly into a separate closed basin completed in 1941 to divert the stream's tributaries to Mono Lake. I should emphasize that Los Angeles does not divert water from the lake, since the lake has always been saltier than the ocean, as a matter of fact, in historic times. There have never even been fish living in the lake.

As the City of Los Angeles diverted those streams beginning in 1948, and has continued to do so for almost 50 years, it's had a dramatic impact on the level of Mono Lake. The lake has declined 41 feet, the salinity has approximately doubled, the surface area has reduced by about 23 percent, although the lake at the present time still has a surface area of about 64 square miles.

Even though the lake has no fish, it has a very abundant, although simple, ecosystem, consisting primarily of brine shrimp and brine flies, which provide a very abundant food source for almost a million eared grebes, 150,000 phalaropes, and 40,000 or 50,000 California gulls, which nest at Mono Lake, in addition to quite a few other areas throughout the West, such as Great Salt Lake.

Needless to say, the declining lake level and the potential impact on the bird life has raised concerns about the long-term impact of the City's continued diversions, spawned a number of lawsuits, the most significant one filed in 1979, which led to a decision of the California Supreme Court in 1983, which basically established a public trust doctrine, which provides that environmental issues can be raised to attack perfected water rights.

There probably was not a more perfected water right in California than the one the City of Los Angeles had succeeded in perfecting through licenses issued by the State of California in 1974. Nevertheless, the State Supreme Court said that there is a need to balance the environmental needs for water at the lake to protect the ecosystem with the City of Los Angeles' needs for water. And as a matter of fact, there are some other lawsuits, five altogether, that are continuing.

Having been in litigation now for over ten years, the parties, the City of Los Angeles, the Audubon Society, the Mono Lake Committee, believed five years ago that, I think recognizing that this was an issue that was going to result in very protracted litigation, we pursued the idea of seeing if there were other ways of resolving the controversy without continued litigation.

The one thing we've done, both the Department of Water and Power, and the various plaintiffs, have engaged in very extensive research at the lake, a lot of it is joint research. The idea being that ultimately the resolution of that issue, such as the Kesterson issue, is probably going to hinge on having accurate factual information, both in terms of the ecosystem which exists at the lake, and also in terms of the alternative water supplies that are available to Los Angeles.

A second thing that we have done is called on the good offices of the UCLA public policy program to act as a facilitator with Dr. LeRoy Graymer being the key participant there. And the various interested parties, the Mono Lake Committee, the Audubon Society, the U.S. Forest Service, Mono County government, the California Department of Water Resources, and a fair amount of cooperation with the Metropolitan Water District, we've been pursuing various alternatives to resolving the Mono Lake issues through cooperation.

And one of the things that I believe there's common agreement on is that the resolution of the Mono Lake issue, recognizing that it's not only a City of Los Angeles issue, it's a State issue, it's been declared a state reserve, and a Federal issue, it's been identified as a U.S. Forest Service scenic area, that there ought to be some common solution.

At any rate, we are moving in the State Legislature with Assembly Bill 444, authored by Assemblyman Isenberg, working together with Bill Baker's AB1442. We have broad support for that bill, which if approved and signed by the Governor, would identify perhaps as much as $75 million to aid in seeking alternative sources of supply.

We have a contract with the Environmental Defense Fund, we've had a lot of good cooperation from Tom Graff and Zack Willey, to try to identify alternate sources of supply, perhaps water marketing opportunities.

And in closing, I think we've been very encouraged that Senator Pete Wilson has expressed a willingness to try and find a role for the Federal Government to participate in a joint resolution, and we would solicit the cooperation perhaps of your committee in assisting in that endeavor.

Thank you.

[The prepared statement of Mr. Georgeson follows:]

Presentation to the Subcommittee on Water and Power
Committee on Energy and Natural Resources
U.S. Senate

August 29, 1989

Duane L. Georgeson*

Mono Lake Controversy

Introduction

I would like to thank Senator Bradley for this opportunity to speak before you today. We are very encouraged to see the interest expressed by the Federal Government to help resolve some of the long-standing water controversies in this State.

I have an interesting assignment today in attempting to present a balanced perspective of the issues that concern not only the Los Angeles Department of Water and Power, but also the other players in the Mono Lake Controversy - the Mono Lake Committee, the U.S. Forest Service, the Environmental Defense Fund, and others.

I think I can do this only because we share some common goals. We all feel that the protection of Mono Lake is not just the responsibility of the City of Los Angeles, but of all who benefit from the protection of this natural resource - the City, State, and Nation.

I cannot stand before you as one having all the answers. We have been in litigation on this matter for over 10 years now and there are still major points of disagreement among the parties, but we have learned a lot, and the efforts we have made are bringing us closer to resolution.

Let me first give you a bit of background on the City and its use of Mono Basin water.

Background

Located in a semi-arid area of the State, Los Angeles, in the early 1900's, outgrew its local water supplies and had to look north for additional water. After procuring land and securing water rights in the Owens Valley, construction began on the First Los Angeles Aqueduct and was completed in 1913.

Continued growth, coupled with a severe drought in the 1920's, prompted the City to look beyond the Owens Valley to the Mono Basin for additional supplies. Permits were obtained and facilities were constructed to divert four major streams tributary to Mono Lake.

*Los Angeles Department of Water and Power

The City has been diverting water from the Mono Basin since 1941. Over the past several years, the City has obtained an average of 90,000 to 100,000 acre-feet of water per year from the basin, or enough water to supply the needs of 500,000 people. This represents 15 percent of the City's total water supply. In addition, the diversions produce 300 million kilowatt hours of clean hydroelectric power as it travels to Los Angeles.

Controversy

Mono Lake is an ancient terminal lake, located just east of the Sierra Nevada Mountains, about 340 miles north of Los Angeles. The lake level is determined by the amount of inflow and precipitation versus the amount of evaporation from the lake.

One half million years of mineral concentration through runoff and evaporation along with declining lake levels due to diversions have made Mono Lake 2.5 times as saline as the Pacific Ocean. Though no fish can survive in the lake's saline water, abundant brine flies and brine shrimp provide enough food for the 750,000 Eared Grebes, 150,000 Wilson Phalaropes, 40,000 to 50,000 California Gulls, and other migratory and nesting birds that rely on the lake.

Among the unique features of the lake are the white calcium carbonate tufa towers that rise from the water and dot the shoreline. These towers were formed under water and have been exposed by the receding water levels of the lake.

Recognition of the unique environmental resources at the lake prompted California to establish the State Tufa Reserve on the south side of the lake in 1982, and in 1984 the Mono Basin National Forest Scenic Area was created.

Since the City began diversions in 1941, the lake level has fallen approximately 41 feet, salinity has doubled, and the surface area of the lake has decreased by 23 percent. The lake currently has an area of 64 square miles.

The falling lake levels have prompted environmental concerns about the ability of the ecosystem, particularly the brine shrimp and brine flies, to tolerate the increasing salinity. Other concerns include the forming of land bridges disrupting gull nesting, and air quality concerns from the increased exposure of the alkali lake bed. These concerns have resulted in the filing of several lawsuits questioning the City's right to continue to divert water from the basin.

The Mono Lake lawsuit, filed in 1979, seeks to restrict diversions from the Mono Basin to protect environmental values at Mono Lake based on the Public Trust Doctrine. In 1983, the California Supreme Court, in giving voice to the Public Trust Doctrine, ruled that the environmental needs of Mono Lake must be balanced with the water supply needs of the City of Los Angeles.

Since that time, the case has changed venue several times and is now before Judge Terrence Finney of the El Dorado County Superior Court. The main case has been coordinated with two other cases involving the maintenance of fish flows down two of the diverted streams.

Just last week, Judge Finney issued a preliminary injunction through March 30, 1990 requiring the Department to discontinue diversions until the elevation of Mono Lake is 6377 feet or higher, in order to maintain the status quo while the merits of the public trust arguments are being decided.

Two additional lawsuits which argued that the City's water rights licenses were not in compliance with portions of the Fish and Game Code were decided in the California 3rd Appellate Court earlier this year. In the decision, the State Water Resources Control Board is required to modify DWP's water rights licenses to include mandatory fish flow releases below its diversions in the Mono Basin.

The resolution of the Mono Lake controversy must address the needs of Mono Lake and its tributary streams, as well as the potential impacts to the City of Los Angeles as a result to a reduction of its highest quality water supply. Still to be decided are: 1) the lake levels to provide adequate protection for the Mono Lake environment; 2) how and from where the water and energy should be replaced; and 3) who would be responsible for the replacement water and energy supplies lost by the City of Los Angels as a result of reduced diversions. The long-term reduction of water diversions could be as high as 70,000 acre-feet per year depending on the lake level to be maintained.

Efforts to Resolve the Controversy

1. Increasing Scientific Knowledge

Only with a solid base of facts on both sides of the balance can an equitable solution be reached. A careful weighing of the environmental and aesthetic needs of the lake and the water supply needs of Los Angeles and the rest of Southern California is essential.

A search for facts about the lake and its environment has led to four governmental studies and close to $4 million of ongoing DWP research. We continue to learn a lot about brine flies, brine shrimp, and the nesting and migratory birds that frequent the lake, and what keeps the entire ecosystem viable.

We also continue to evaluate the water supply outlook for Southern California and investigate potential sources of replacement water and new opportunities for water conservation and water reclamation.

In late 1988, the Department of Water and Power Board of Commissioners (Board) adopted a Policy Statement on Mono Lake which recognizes the importance of the unique natural resources in the Mono Basin and acknowledges that at some point in time diversions will have to be reduced in order to keep the ecosystem viable. The Policy Statement also recognizes that the Mono Basin supply is among the highest quality water available to the people of Los Angeles, and that long-term reliable replacment supplies are uncertain.

In the Policy Statement, the Board states that, since Mono Lake is a resource of significant value to many in the City, State, and Nation, the responsibility of replacement water should be shared by the City, State, and Federal Governments.

2. Maintain Open Communication

With any long-term controversy, it is easy for the different parties to become polarized. Claims and accusations can be made on both sides that are destructive rather than constructive. It is much more productive to sit down together and work cooperatively in exploring alternative approaches that might lead to a resolution that would be agreeable to all parties. (For example - Inyo/LA Agreement on groundwater pumping.)

In the Mono Lake situation, we have been working for the past five years through the UCLA Public Policy Program (PPP) to explore creative ways to find solutions to our differences. The Mono Lake Group of the PPP, under the direction of Dr. LeRoy-Graymer, is comprised of representatives from the Mono Lake Committee, the City of Los Angeles, the U.S. Forest Service, the California Department of Water Resources, and the Mono County Board of Supervisors. By working together, the group has been able to identify several common goals.

The group has contracted with the Environmental Defense Fund (EDF) to identify additional water supplies that might be used to replace existing diversions from the Mono Basin. EDF has been focusing on water marketing opportunities that would allow conserved water from agriculture to be used to benefit Mono Lake. Discussions are currently being held with two water districts in Central California. One contracts for water from the Central Valley Project; the other, which has appropriative rights to water from the San Joaquin River, receives "exchange water" from the Federal Government.

The group has also discussed legislative approaches that could help provide or fund replacement water and energy to benefit Mono Lake.

3. Legislative Solutions

The City, the Mono Lake Committee, and others are supporting Assembly Bill 444, introduced by Assembly members Phillip Isenberg, Bill Baker, and others. This bill would enact the Environmental Water Act of 1989 which would establish an environmental water fund totalling approximately $75 million to help finance water related projects that will benefit the environment. The legislation provides that preserving the wildlife and environment of the Mono Lake Basin would be given a first priority. The legislation also provides that State assistance is subject to the California Department of Water Resources, the Mono Lake Committee, and the City of Los Angeles entering into one or more agreements in order to ensure the expenditure of State funds will benefit the Lake's ecosystem and contribute to permanent protection of the Mono Lake Basin environment.

Participants of the Mono Lake Group also believe that federal policies and legislation should be implemented to provide water and/or funds for the preservation of Mono Lake. The appropriate means of federal assistance might be funding for replacement water, increased cooperation with the State to allow more sharing of the water resources within the State, or simply the freeing up of federal project water for environmental purposes.

Senator Pete Wilson (R-California) has indicated an interest in sponsoring legislation to make the Federal Government a partner with the State and the City of Los Angeles in a joint effort to preserve Mono Lake. We feel this would be a constructive step for the Federal Government and we encourage your efforts to help find a solution to this complex problem.

LADWP POLICY STATEMENT ON MONO LAKE

1. Water diversions by the DWP from the Mono Lake Basin are an important source of high quality water for the City. Mono Basin water also produces a substantial amount of clean, non-fossil-fuel-based electricity for the City. The people of the City own established water rights under state law authorizing these diversions and have relied on these rights and the water those rights secure for many years.

2. The Department will consider any decrease in Mono Basin diversions in light of two important realities.

   a. The Department faces considerable uncertainty today with regard to every one of its basic sources of water: in the Mono Basin, in the Owens Valley, from the Colorado River, from the State Water Project, and from groundwater pumping in the San Fernando Valley. The reliability of supply from each of these sources is less than it has been in decades.

   b. Today, all water purveyors are under increasing pressure to serve the highest quality of water available. Mono Basin water is the highest quality water currently available to the Department. A loss of Mono Basin water would force the Department to serve more water of slightly lesser quality.

3. The Department believes that, based on available scientific evidence, the Mono Lake ecosystem is currently in a healthy and productive state, particularly in regard to the most critical issue of the Lake's ability to provide food and habitat for large numbers of migratory birds. The DWP will continue to participate cooperatively in research and monitoring programs designed to determine the lake levels necessary to maintain the Mono Lake ecosystem in a healthy state.

4. The Department must view the water needs of the residents of the City as its first priority. However, the Department recognizes that for many citizens of the City, State and Nation, the lake is a unique environmental resource of significant value. The Department acknowledges its responsibility to do what it reasonably can to maintain the lake in an environmentally healthy condition. The Department also recognizes that to do so will, at some point in time, require a reduction in the City's authorized diversions which must be replaced.

5. The Department believes it is incumbent on all concerned -- the City, the State, the Nation, the environmental community, and other relevant entities -- to work together to find means by which both the needs and requirements of both the City and the lake can be accommodated.

6. Specifically, the Department believes that the responsibility for providing high quality replacement water and energy supplies for the City must be shared by the State and Federal governments and other interested parties. The Department hopes that such a sense of shared responsibility will enable all concerned to reach a settlement that best serves the needs of people and the environment.

7. The Department will continue to vigorously pursue the practical implementation of water conservation and reclaimed water projects.

8. The Department pledges its best efforts to reach such a settlement. Until such a long-term settlement or solution is achieved, however, the Department must continue to represent the needs and rights of the people of the City.

AMENDED IN SENATE AUGUST 21, 1989

AMENDED IN ASSEMBLY JUNE 29, 1989

AMENDED IN ASSEMBLY JUNE 19, 1989

AMENDED IN ASSEMBLY MAY 25, 1989

AMENDED IN ASSEMBLY APRIL 24, 1989

Introduced by Assembly Members Isenberg, Baker, Costa, Katz, and Norman[ ] [Waters) Waters](Principal coauthor: Senator Garamendi)(Coauthors: Assembly Members Farr, Filante, Friedman, Hauser, Johnston, and Klehs)(Coauthor: Senator Kopp)
February 1, 1989

An act to add Chapter 7.7 (commencing with Section 12929) to Part 6 of Division 6 of the Water Code, relating to water facilities.

LEGISLATIVE COUNSEL'S DIGEST

AB 444, as amended, Isenberg. Water conservation and water quality.

Under existing law, various provisions have been enacted to provide financial assistance for water conservation and water quality projects.

This bill would enact the Environmental Water Act of 1989. The bill would declare the intent of the Legislature that the Department of Water Resources expend money appropriated to it from the Environmental Water Fund for water resources projects or loans that will contribute significant environmental benefits.

The bill would require the department to enter into[a specified] [agreement] ONE OR MORE AGREEMENTS to protect and preserve the Mono Lake Basin and would require the department, as a first priority, to expend available funds to preserve the wildlife and environment of the Mono Lake Basin. THE BILL WOULD PROHIBIT THE STATE FROM EXPENDING ANY MONEY TO REPLACE WATER AND POWER SUPPLIES LOST BY THE CITY OF LOS ANGELES BECAUSE OF A FINAL COURT JUDGMENT REGARDING MONO LAKE. The bill would specify related matters.

The bill also would create the Water Quality Program, and require the department to expend money appropriated to it from the Environmental Water Fund for projects or programs of public agencies that will reduce the amount of agricultural waste effluent and provide conserved water to the State Water Resources Development System. The bill would specify related matters.

The bill would become operative only if AB 1442 is enacted.

Vote: majority. Appropriation: no. Fiscal committee: yes. State-mandated local program: no.

The people of the State of California do enact as follows:

DELETED MATERIAL IS IN BRACKETS [ ]. ADDED MATERIAL IS CAPITALIZED.

SECTION 1. Chapter 7.7 (commencing with Section 12929) is added to Part 6 of Division 6 of the Water Code, to read:

C 7.7. E[, C] W A 1989Article 1. General Provisions

12929. This chapter shall be known and may be cited as the Environmental Water Act of 1989.

12929.1. It is the intent of the Legislature, in enacting this chapter, to prescribe the purposes of the Environmental Water Fund, and to create, and prescribe the purposes of, the Environmental Water Program and the Water Quality Program.

12929.2. As used in this chapter, the following terms have the following meanings:

(a) ``Department'' means the Department of Water Resources. [ ]
[(b) ``Environmental Water Fund'' means the Environmental Water Fund]
[created pursuant to Section 12929.10.] [ ]
[(c)]

(B) ``Environmental Water Program'' means the Environmental Water Program created pursuant to Article 3 (commencing with Section]
[12929.20).[ ]
[(d)]

(C) ``Mono Lake Committee'' means the California nonprofit citizens organization formed to save Mono Lake.[ ]
[(e)]

(D) ``Water Quality Program'' means the Water Quality program created pursuant to Article 4 (commencing with Section 12929.30).

Article 2. Environmental Water Fund

12929.11. The department shall expend the money appropriated to it from the Environmental Water Fund for projects or programs concerning the water resources of the state that will contribute significant environmental benefits.

12929.14. From the funds appropriated to the department from the Environmental Water Fund, it is the intent of the Legislature that the department shall[allocate twelve million five hundred thousand dollars]
[($12,500,000)] ALLOCATE TEN MILLION DOLLARS ($10,000,000) per year to programs and projects defined in the Environmental Water Program. [ ]
[12929.15. From the funds appropriated to the department from the]
[Environmental Water Fund, it is the intent of the Legislature that the]
[department shall] [allocate three million seven hundred fifty]
[thousand dollars ($3,750,000) per year to programs and projects defined]
[in the Water Quality Program.] Article 3. Environmental Water Program

12929.20. The Legislature hereby finds and declares that diversions of water out of the Mono Lake Basin by the City of Los Angeles have lowered the water level of Mono Lake and that future water diversions need to be managed to[restore and] protect Mono Lake. The department shall, as a first priority, expend money available from the Environmental Water Fund to preserve the wildlife and environment of the Mono Lake Basin.

12929.21. For purposes of implementing Section 12929.20, the department shall enter into[an agreement] ONE OR MORE AGREEMENTS with the City of Los Angeles and the Mono Lake Committee to protect and preserve the Mono Lake[Basin by restoring and maintaining Mono Lake at a]

[water level which offers permanent protection to nesting and migratory] [bird populations, minimizes air quality degradation, and preserves the] [Mono Lake Basin environment.] [The agreement shall include, among other things, a minimum lake level] [and a] [buffer of water above the minimum level, minimum stream] [flows, a diversion plan for wet and dry years, and a plan to restore the] [lake to the agreed upon level after dry years. The agreement shall] BASIN. ANY AGREEMENT OR AGREEMENTS BETWEEN THE DEPARTMENT AND THE CITY OF LOS ANGELES AND THE MONO LAKE COMMITTEE, AND ANY EXPENDITURES BY THE STATE WITH RESPECT TO THE AGREEMENT OR AGREEMENTS, SHALL BENEFIT AND ENHANCE THE LAKE'S ECOSYSTEM AND CONTRIBUTE TO PERMANENT PROTECTION OF THE MONO LAKE BASIN ENVIRONMENT, INCLUDING, BUT NOT LIMITED TO, NESTING AND MIGRATORY BIRD POPULATIONS, AIR QUALITY, FISH, AND OTHER WILDLIFE. THE AGREEMENTS SHALL not unreasonably affect fish, wildlife, or other instream beneficial uses.

12929.22. Funds expended for purposes of Section 12929.20 shall be expended only for an eligible project which is consistent with[the] AN agreement entered into pursuant to Section 12929.21.

For purposes of this section, ''eligible project'' means a water or power conservation project, a waste water reclamation project, a conjunctive use program, a groundwater recharge project, the enlargement of existing water or power facilities owned by the City of Los Angeles, electric power production facilities, or a water marketing program, that is consistent with the agreement entered into pursuant to Section 12929.21. Priority shall be given to projects or programs that conserve water or power.

12929.23. THE STATE SHALL NOT EXPEND ANY MONEY TO REPLACE WATER AND POWER SUPPLIES LOST BY THE CITY OF LOS ANGELES BECAUSE OF A FINAL COURT JUDGMENT REGARDING MONO LAKE.

12929.24. THIS CHAPTER DOES NOT AFFECT THE RIGHTS OR OBLIGATIONS OF ANY PARTY INVOLVED IN LITIGATION REGARDING MONO LAKE.

12929.25. The department may also make loans or grants pursuant to this article for projects or programs which benefit the state's rivers, bays, lakes, estuaries, or marshes. The department shall confer with appropriate state and federal agencies on the feasibility of eligible projects.

Article 4. Water Quality Program [ ]

[12930.]

12929.30. The Water Quality Program includes projects or programs of public agencies that will reduce the amount of agricultural waste effluent and provide conserved water to the State Water Resources Development System.

12929.31. Any matching requirement pursuant to this article may be satisfied by conserved water made available by the public agency to the State Water Resources Development System. All matches of conserved water shall be on a voluntary basis, and the value of the water supplied shall be determined by negotiation between the department and the public agency.

12929.32. First priority shall be given to projects or programs that

both improve the quality of water in the Sacramento-San Joaquin Delta, San Francisco Bay, or State Water Resources Development System and increase the amount of water available to the State Water Resources System. Second priority shall be given to projects and programs that increase the amount of water available to the State Water Resources Development System.

Article 5. Administrative Provisions

12929.40. In developing its recommendations for the appropriation of funds pursuant to this chapter, the department shall consult with the Department of Fish and Game and other appropriate local, state, and federal agencies and interested private groups and members of the public.

12929.41. (a) Programs and projects pursuant to this chapter may be undertaken by means of any of the following:

(1) Direct expenditure by the department.

(2) Loans to public and private agencies.

(3) Grants to public agencies.

(4) Any combination of paragraphs (1), (2), and (3).

(b) All grants shall be matched by at least an equal amount from the applicant public agency or pursuant to Section 12929.31.

12929.42. The department may seek participation by, or a sharing of costs with, the beneficiaries of programs and projects undertaken pursuant to this chapter, including, but not limited to, public and private local entities. The department may also seek participation by, cost sharing with, or financial assistance from, federal agencies which have related programs.

12929.43. Money may be expended pursuant to this chapter for, among other purposes, acquisition of interests in real property.

12929.44. The department may adopt rules and regulations as it determines to be necessary to carry out this chapter.

12929.45. Any contract for a grant or loan entered into pursuant to this chapter shall include, but not be limited to, all of the following provisions:

(a) An estimate of the reasonable cost of the project or program.

(b) An agreement by the public agency to proceed expeditiously with, and complete, the project or program; to commence operation of any project upon completion and to properly operate and maintain the project in accordance with applicable provisions of law; to provide for the payment of the agency's share of the cost of the project or program, including the principal of, and the interest on, any state loan made pursuant to this chapter; and if appropriate, to apply for, and make reasonable efforts to secure, federal assistance for the project or program.

12929.46. All loan repayments received pursuant to thiu chapter shall be deposited in the fund from which the loan was made.

12929.47. The department shall submit an annual report to the Legislature of its activities under this chapter.

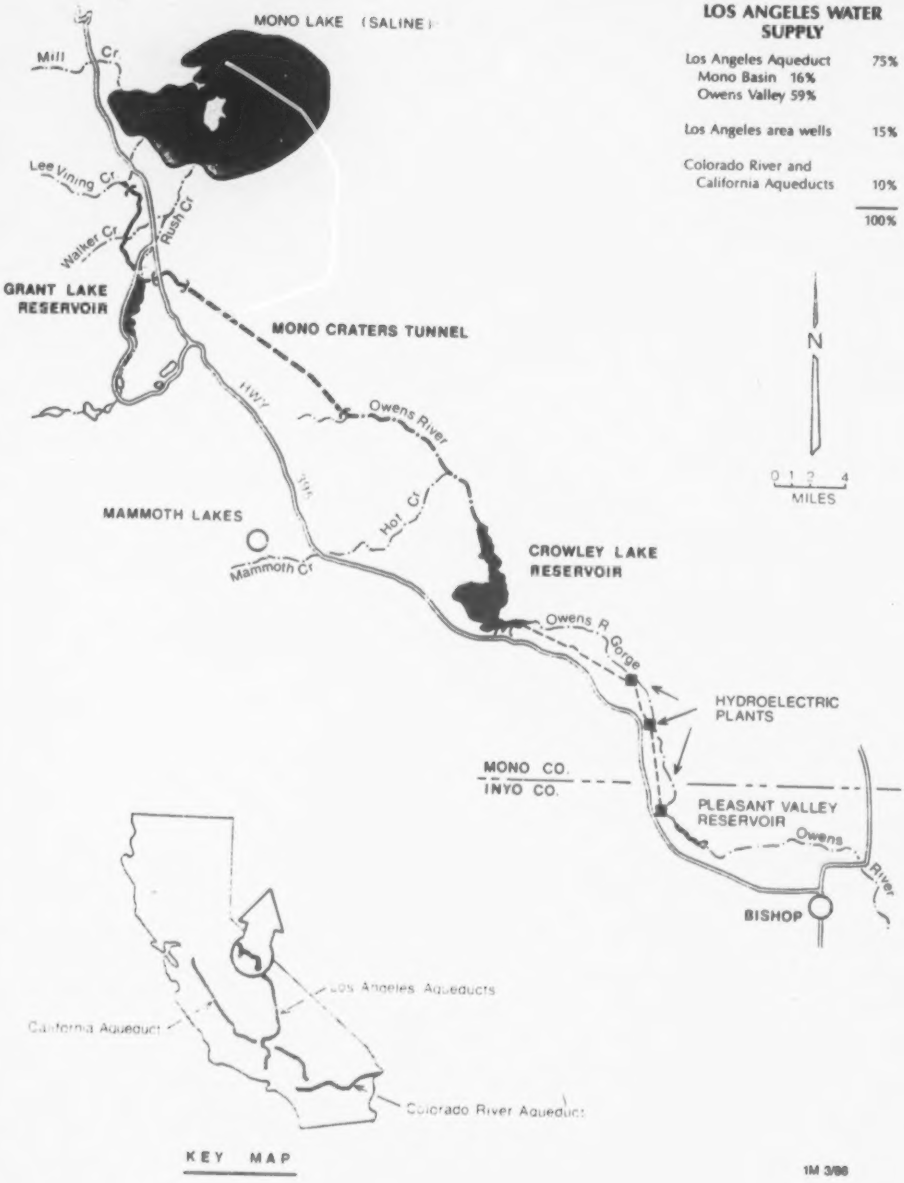
SEC. 2. This act shall become operative only if Assembly Bill 1442 of the 1989:90 Regular Session is enacted and becomes operative.

BILL NO?

MONO BASIN EXTENSION OF LOS ANGELES AQUEDUCT

LOS ANGELES WATER SUPPLY

Los Angeles Aqueduct	75%
Mono Basin 16%	
Owens Valley 59%	
Los Angeles area wells	15%
Colorado River and California Aqueducts	10%
	100%


MONO LAKE (SALINE)
Mill Cr.
Lee Vining Cr.
Walker Cr.
Rush Cr.
GRANT LAKE RESERVOIR
MONO CRATERS TUNNEL
HWY 395
Owens River
Hot Cr.
MAMMOTH LAKES
Mammoth Cr.
CROWLEY LAKE RESERVOIR
Owens R. Gorge
HYDROELECTRIC PLANTS
MONO CO.
INYO CO.
PLEASANT VALLEY RESERVOIR
Owens River
BISHOP
N
0 1 2 4
MILES
Los Angeles Aqueducts
California Aqueduct
Colorado River Aqueduct
KEY MAP

1M 3/88

LOS ANGELES TIMES
AUGUST 17, 1989

MWD May Back Bill on Mono Lake Water Dispute

By VIRGINIA ELLIS, *Times Staff Writer*

SACRAMENTO—The Metropolitan Water District, which wields strong clout with lawmakers, is preparing to join Los Angeles in supporting legislation designed to force a settlement of a decades-long dispute over water diversions from the Mono Lake Basin.

General Manager Carl Boronkay said Wednesday he is recommending that his 51-member board of directors endorse the landmark proposals by Assemblymen Phillip Isenberg (D-Sacramento) and William Baker (R-Danville) because they provide funds for the city to develop other water sources.

The proposals direct Los Angeles to reach an agreement with environmentalists on a plan for protecting the lake, which both sides acknowledge would include requirements that the city reduce its diversions from the basin. They also create a $100-million Environmental Water Fund that can be used to help the city develop other water projects.

Boronkay said the funding would allow the city to make up for its water losses from the Mono Lake Basin in the eastern Sierra without having to make substantial demands on the Metropolitan Water District. The MWD serves a group of Southland communities that does not include Los Angeles except intermittently when the city's other water sources fall short.

"If you give them the dollars to go somewhere else and find substitute water, then that helps all of us," Boronkay said. "They're not an additional burden to us. We want this money to encourage them to get a substitute supply knowing they can always fall back on us if necessary."

Without the legislation, he said, the dispute over Mono Lake is likely to be settled by the courts, which so far "seem not to favor the position of Los Angeles." Nor, he said, do the courts seem willing to address the issue of the costs the city would have to incur to find other water sources.

The lawsuits filed by environmental groups contend that the city's diversions have lowered the lake level and endangered its ecosystem. The city draws one-seventh of its water supplies from the Mono Lake Basin. The water also produces electricity for the city as it flows through power plants along the aqueduct system.

Baker said decisions by the water district and the city to support the legislation creates a "very strong likelihood" that it can now pass the Legislature.

"I think the district and the city have considerable influence in the committees in both houses but especially in the Senate. The package had been running into a bit of a problem in the Senate," he said.

On Tuesday, the Los Angeles City Council formally endorsed the bills after Councilman Zev Yaroslavsky argued that the legislation was the city's best chance to get state funding for the development of replacement water sources.

"The residents of this city for over 40 years have received a clean and steady supply of water from the Mono Lake Basin," he said. "Now is the time to balance the city's needs with those of the Mono Lake Basin ecosystem."

The bills have passed the Assembly but are still pending in the Senate Committee on Agriculture and Water.

DAILY NEWS
AUGUST 18, 1989

Plan to save Mono Lake urged

L.A., state officials support bill to find alternate sources of water for city

By RICK ORLOV
Daily News Staff Writer

In what was hailed as an end to 50 years of feuding over Mono Lake, Los Angeles officials joined state lawmakers and environmentalists Thursday to support legislation to find new sources of water for the city.

"You see standing before you a collection of scarred warriors from the water battles of California," said Assemblyman Phil Isenberg, D-Sacramento.

"These are people who normally would fight all the time . . . but we're here today to announce unified support to attempt to resolve the controversy over Mono Lake," he said.

Los Angeles now diverts streams that flow into Mono Lake in Northern California, which has lowered the water level in the lake. Isenberg's bill, AB 444, would give Los Angeles $100 million to find alternate sources of water.

In addition, the bill sets up a $75 million fund for improvements to raise the Mono Lake water level, $60 million to fund levees for the Sacramento delta, $75 million for recreation at state Water Project Facilities and authorizes the state Department of Water Resources to participate in programs to clean and conserve water.

If the measure is successful, Isenberg said the Mono Lake water level could rise within two years.

The Mono Lake watershed is the source of one-seventh of the city's annual water needs, and the water also powers city hydroelectric stations along the aqueduct from the eastern Sierra Nevada.

The city's diversion of the water has long been a source of controversy, and environmentalists have won two court battles which forced the city to reduce the amount of water it takes.

Joining Isenberg at the City Hall news conference were council President John Ferraro, Councilman Zev Yaroslavsky, Assemblyman Richard Katz, D-Panorama City; state Sen. John Garamendi, D-Walnut Grove, Water and Power Commissioner Walter Zelman and Martha Davis of the Mono Lake Committee, an environmental group.

It is the broad nature of the bill that Isenberg said was the key to winning the wide support the bill has gained, including the Metropolitan Water District, northern California legislators and representatives from both political parties.

The next step for the bill is a hearing Wednesday before the Senate Agriculture and Water Resources Committee. Sen. Ruben Ayala, D-Chino, who heads the committee, sent a telegram to Isenberg expressing support for the measure.

Gov. George Deukmejian has not taken a position on the measure but Isenberg said he is confident of winning over the governor because of the wide suppor the measure has received.

Ferraro said the measure was turning point in the city's rela tions with Mono Lake, whil Yaroslavsky hailed it as a firs step.

"Let's not kid anyone, this won't solve all the problems for Mono Lake," Yaroslavsky said. "We still have to conserve water in Los Angeles. We can't continue to guzzle it as we have."

Zelman said the city's support of the bill represents substantial progress.

"It will not, in and of itself, put more water into Mono Lake," Zelman said. "But it could open the door to more discussion, to more cooperation and to further agreements on permanent solutions to the Mono Lake problem."

Isenberg also credited Katz with authoring legislation allowing farmers to sell their water rights — a possible replacement source for the Mono Lake watershed.

Senator **Bradley**. Is this the bill that envisions the use of Federal dollars to solve the problem?

Mr. **Georgeson**. The State Bill envisions the use of funds which are being repaid by the State contractors, that initially came out of the State's tidelands funds. And that is the bill which Assemblyman Isenberg has moved through the Assembly and is on the Senate floor.

Senator **Bradley**. OK.

Mr. **Georgeson**. However, I think in anticipation and a hope that there might be similar participation by the Federal Government.

Senator **Bradley**. Mr. Boronkay, let's say you were the head of the Bureau of Reclamation. You also know Los Angeles and Metropolitan Water District's problems. What three things would you do as the head of the Bureau to help your old friends? [General laughter.]

Mr. **Boronkay**. As I indicated, I would take a hard look at the California projects, take the situation along the Colorado River. Is all that water being used efficiently?

Senator **Bradley**. You mean California's share under the seven state compact?

Mr. **Boronkay**. Yes, California's share. I'm not suggesting that we reallocate the states' shares. The Bureau has itself regulations regarding water efficiency. I don't know that anything's ever been done about it.

Senator **Bradley**. Okay, so the first thing you'd do is make sure California was getting its share.

Mr. **Boronkay**. Yes.

Senator **Bradley**. That has been allocated.

Mr. **Boronkay**. Making effective use of its share.

Senator **Bradley**. And this is where you'd deal with the canals and the channels.

Mr. **Boronkay**. Yes.

Senator **Bradley**. Concrete, pour it.

Mr. **Boronkay**. That's right. That's basically it. And also, I think it wouldn't be inappropriate for the Federal Government to pay, for example, for that experimental inplace lining. That's not just for Metropolitan.

Senator **Bradley**. Right, OK.

Mr. **Boronkay**. It's for the world.

Senator **Bradley**. That's your first suggestion. Have you got any others?

Mr. **Boronkay**. Well, I'd like them to continue in terms of the Central Valley Project, to cooperate with it, and see wherein, situations like Arvin-Edison.

Senator **Bradley**. Right.

Mr. **Boronkay**. Where you can have exchanges.

Senator **Bradley**. Okay.

Mr. **Boronkay**. I also would appreciate their encouragement for our working with Federal contracts, as Mr. Peltier and myself and others are commencing some exchanges of information, exploring what can be done in terms of reallocation of Federal water. Can the Bureau be helpful there.

Senator **Bradley**. I must say, hearing your problem, I'm not sure that's going to answer it. I mean, you've got a problem of colossal proportions.

Mr. **Boronkay**. And ultimately, I think, the public has to recognize that, and we will get back to certain construction. We've have to indicate that we've done all the conservation, we've done all these other things. But ultimately, something in the way of construction, in which we support the State movement, the State deepening, widening of channels, to get more water through, not to waste water, to improve water quality.

And I know Mr. Kennedy may have addressed this, but we support efforts of the State to build a reservoir, Los Banos, yes. There are construction projects in which we rely on the State, as part of the State Water Project.

Senator **Bradley**. But even all of those things, do you think that's really going to solve your problem? You've got a lot of people coming.

Mr. **Boronkay**. We have also——

Senator **Bradley**. St. Louis every year. [General laughter.]

Mr. **Boronkay**. I don't know what's going to be left of St. Louis if they come here. But there is a number of things on the drawing board, and I didn't mention them all. But the 10(h), the coordinated operations agreement legislation, provides for an interim sale of substantial water. We hope it's more substantial than the numbers I've been hearing of late, to the State Project.

If we can get the 300,000, 400,000 acre feet from Imperial in a timely fashion, if we can get the 100,000 from the All American and Coachella Canals, if the State can get a half a million acre feet from the Central Valley Project, we get about half of what the State gets.

If the State fills Los Banos Grandes, and that's 1.7 million acre feet possibly, and I don't know what the annual yield is, that's still under study. If the State is able to go ahead with the work in the Delta, that would save considerable water, perhaps 250,000 acre feet. If these things that they come by in a timely manner, plus the efforts we're making to reduce per capita use of water——

Senator **Bradley**. You just squeeze through.

Mr. **Boronkay**. I'm afraid that is correct, we squeeze through, we look at a planning period of the year 2000, then we look at a planning of the year 2010, and the columns add up. I would like the comfort you're suggesting of not squeezing through.

Senator **Bradley**. By figuring out how to keep people in St. Louis. [General laughter.]

Senator **Bradley**. For everything to happen that you've outlined there, and within the timeframe that you have outlined, if one were to assess probability, being a reasonable man, what would you say to the probability, Mr. Georgeson?

Mr. **Georgeson**. I think we need to keep in mind that the shortage does not occur every year. It's the dry years that we're trying to armor ourselves against in the short term.

Senator **Bradley**. You're going to go on television and tell that to the people in Los Angeles?

Mr. **Georgeson**. No. What we're going to do is to try and find ways in the short term to store the water that's available in the wet years. Projects like Los Banos Grandes, projects like the Arvin-Edison, projects like we have in Southern California to store water from State projects in wet years to use in dry years, but that unfortunately requires structural improvements through the Delta to move that surplus water in the wet years, so we don't need to depend so heavily on the Delta in the dry years.

Mr. **Boronkay**. May I add to that, there's historic programs that are extraordinarily important, because as Mr. Georgeson points out, it's that periodic dry season that we're guarding against. The Kern bank is perhaps a million acre feet of storage capacity in a groundwater basin adjacent to the State Water Project. Now, if that can work out, we'll store a million acre feet there. That's like building a huge new reservoir.

Metropolitan is working on a number of groundwater programs within its own area, not of that size, but they all add up.

Senator **Bradley**. I haven't lived with this as long as all of you have, to be sure. But it seems to me that one of the themes that's gone through this day of hearings is that we're in a new day. There is a new Bureau, we have new mandates. We are doing things differently than we have done in the past. The days of the old construction program are over, that kind of thing.

And yet here you have a problem. The assumption is that there will continue to be projects built to accommodate whoever chooses to move from wherever in the United States to Los Angeles or San Diego. I mean, there's non-uniformity of agreement between Los Angeles and San Diego, would you not concur?

Mr. **Boronkay**. Well, I concur.

Senator **Bradley**. Okay, and so there are going to be some real problems down the line, that it's all going to fall on Mr. Schuster's back to answer, because he's the one that isn't producing the water that all of you contracted for. [General laughter.]

Senator **Bradley**. And I must say that that's been kind of red flag that's gone up today. Mr. Schuster, do you have anything to say?

Mr. **Schuster**. I'm innocent. [Laughter.]

Mr. **Schuster**. I have two clarifying things, I think. One was when Carl was talking about what the Bureau can do, and your reaction was correct, that that didn't do much to solve our problem.

One of the reasons for that is that we, the users of the State Water Project, and that's what Carl was talking about, our water supply, I'm not looking to the Bureau to solve that problem, I want to make that clear. The State Project is the issue, I'm not looking for Congress' help.

And I both agree with you and to some extent disagree. I think we have a myriad of operations available to us to solve the problems. They include construction, but they don't only include construction. It includes a vast package, it includes water marketing, water conservation, wastewater reclamation, some fairly exciting conjunctive use type programs that we can actually make water available in dry years through pumping and so on.

And there's lots of things we can do. The place where I agree with you and share some of your pessimism is, many of those things we can't do, until we finally solve the problem in the Delta.

We can't get the water through the Delta, even if we do it north of the Delta. And so that's where I'm pessimistic.

Senator BRADLEY. And that comes back to the problem of the perception of the Bureau, the new Bureau.

Mr. SCHUSTER. Then let me ask them to get involved.

Senator BRADLEY. And my question to you would then be, what are the two or three things that the Bureau could do to establish their environmental credentials?

Mr. SCHUSTER. To some extent it's something I've been talking about since the early 1970's. I think we—being with the Bureau in the past—need to go back and sort of clean up some of the things that we did wrong from an environment standpoint in our haste to develop water that was needed at that time. They've had successes, such as the Trinity and the Suisun Marsh.

I think areas I'd concentrate on now is, one, on the salmon problems in the Sacramento and the San Joaquin Rivers; two, I'd move back into the Delta and look at some of the water transfer issues, and some of the water quality issues, including the South Delta, which the Bureau, by the way, is doing in the South Delta water agency right now.

And then three, assuming the success in the first two, I'd start concentrating on some of the conjunctive use programs the Bureau is proposing through the water marketing, concentrating right now on the east side of the Delta, places where we have a chance for some win-win situations, New Melones being key, and maybe some of the other east side developments, where you can go into conjunctive use programs, not hurt the existing water users, maintain their needs, move the water downstream to help fish, and then eventually pump it south, so there's lots of folks winning.

If I was the Bureau, I'd do that. Again, the same reaction, that's not going to do a lot for the State Project, but you asked me if I was the Bureau.

Senator BRADLEY. Okay. Let me if I could, try one last question to you, Mr. Schuster. We're really running out of time. Tell me, you made a statement that, I think I have it written down here right, you said that if there is a failure to resolve fish and wildlife issues, it may adversely impact the reliability of new and existing CVP water supply contracts. What does that mean?

Mr. SCHUSTER. You probably wrote it down correctly and I said it poorly. Basically, what I was saying was, I think one of the reasons the Bureau should put fish and wildlife issues on their top priority at this time is that the amount of water they actually have for sale and the reliability of that water is unknown at this point in time, and I mixed the two things up.

Senator BRADLEY. Oh, all right. I have one last question to Mr. Peltier. Earlier today you heard Mr. Candee talk about the Boswell situation. Do you think that the Secretary made the right decision there? The second one.

[Laughter.]

Mr. PELTIER. I can't substitute my judgment for the Secretary's responsibility——

Senator BRADLEY. But it wouldn't have——

Mr. PELTIER. Let me dodge that, because I'm sure that he did it in accord with advice from the Solicitor's office, and that there was a basis for that decision. I guess the concern that we have goes to the broader picture of Hal Candee saying, they handed it to us on a silver platter, and that was our concern from the beginning, relative to the Boswell thing.

We disagree with his perspective on it, but we're concerned about the politics, because we see trusts used widely, and used well for family——

Senator **Bradley**. But wouldn't a fair man looking at the situation, seeing this, say this is probably not following the intent of the Reclamation and Reform Act?

Mr. **Peltier**. Not necessarily. I think a fair man could look at it and say, this gets pretty close to land reform, where you can break up that single holding into 250 some-odd ownerships, when it could, in fact, be 30 or so, and I'll still be in compliance with the reclamation limitation.

Senator **Bradley**. So you don't see any problem with the thing.

Mr. **Peltier**. I wouldn't say that. [Laughter.]

Mr. **Peltier**. I'm not aware of any legal problems as far as compliance with the law.

Senator **Bradley**. But think of your members.

Mr. **Peltier**. I'm certainly aware of the problem, the perception problems.

Senator **Bradley**. Does that create a problem for your members?

Mr. **Peltier**. Yes. That's why we voiced concern in the first instance, because we're concerned about the impact on the hundreds of other trusts out there that are used for family, keeping brothers farming together, for instance. It's not an easy one.

Senator **Bradley**. Thank you. Congressman Fazio, do you want any kind of closing thoughts?

Mr. **Fazio**. Yes, I had decided at this point I wouldn't ask any questions, but I'd appreciate just a chance for a concluding word.

We've heard a lot about the need for the new Bureau to have the resources to do the studies, to make the improvements like the All American Canal, and to make up for the O&M shortfalls that annually are submitted as part of the executive budget, and pick them up with a new combination of people who don't seem to be on board to handle all the new responsibilities that the Bureau has.

It seems to me that one of the things we need to carry back to Washington is that the new Bureau needs the resources that it has been lacking, for reasons that relate to its unpopularity with lots of different types of people.

It's time to, as I think Mr. Schuster said, in a sense reinvest in the new Bureau, if we're going to get the outputs that we all agree are needed. I think Jason pointed out a number of those as well.

It's not going to be easy in our budgetary environment, and a lot of these problems have been driven by budget shortfalls, not because of a lack of interest or will. But I think it will be much more likely to occur if people like Senator Bradley, who don't have any immediate direct benefit in their own constituency, can understand these issues and carry the ball for those of us who more often appear to have a self-interest in pushing these issues.

So I simply want to conclude by thanking you, Senator, for your spending the whole day with the California water community, and more importantly, for having done your homework in a way that makes it obvious to everybody that this is not just an exploratory hearing on your part, not just an effort to show the flag, but really, an exercise on behalf of a very well-informed and dedicated public servant.

And I want to, on behalf of all of us, thank you for your efforts.

Senator **Bradley**. Thank you very much for your comment. Actually, this was just an attempt to get network coverage. [General laughter.]

Senator **Bradley**. And it failed. [General laughter.]

Senator **Bradley**. Let me thank the entire panel for your comments, and let me remind you that the new Bureau, the thought that there should be a new Bureau, has never been really a congressional decision, this was a thought of the former Secretary of Interior.

One of the many things I found intriguing over the course of the day's hearing is how it is accepted on the part of everyone who testified that there should be a new Bureau. You've helped us define some of the aspects of what the new Bureau should be concerned with.

I've found today very helpful, and I appreciate the time and the preparation that went into each of your presentations. We'll move on to the next phase of this process.

Thank you very much.

[Whereupon, at 4:15 p.m. the hearing was adjourned.]

APPENDIX

Additional Material Submitted for the Record

PLEASE REPLY TO

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California State Senate

JIM NIELSEN
Senator
Fourth District
Butte, Colusa, Glenn, Lake, Napa, Shasta and
Tehama Counties and a portion of Sonoma County

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STATE ALLOCATION BOARD

September 8, 1989

Senator Bill Bradley, Chairman
Senate Water and Power Subcommittee
364 DSOB
Washington, D.C. 20510

ATTN: Tom Jensen

Dear Senator Bradley:

I recently received information on a hearing that was conducted in Sacramento regarding the federal government's role in resolving many of California's water issues. I am submitting comments to be included in the hearing record.

Since 1978, when I was first elected to the California State Legislature, I have focused a great deal of my time and interest on water issues, including the Delta, which I initially represented, and now the Northern California watershed area. My efforts were enhanced by a Northern California Water Task Force which I formed that presently includes over one hundred members. This group meets with me on a regular basis to become better informed on and involved in, water issues. We have been very successful in legislative and administrative efforts to resolve some of the water problems in my Senatorial District.

The most significant legislation of late has been Senate Bill 1086 which brought together twenty five local, state and federal agencies and private interest groups to formulate a management plan for the Upper Sacramento River involving fishery and habitat restoration.

Two separate groups with different functions, the SB 1086 Action Team and the Advisory Council, met for two years structuring a program which would accomplish SB 1086's goals and objectives. The Plan was presented to the California Legislature in January of this year. The lead agency in promoting and implementing the plan is the Department of Water Resources. This agency, along with the California Water Commission, has hailed the plan as a prototype to resolving many other water issues in California.

The Bureau of Reclamation's Western Region Director, Larry Hancock, stated at my most recent Water Task Force meeting that two of the recommendations in the SB 1086 report were the top priorities for the Bureau this year in dealing with water issues. Those were the water temperature control device at Shasta Dam and improvement of the fish passage at the Red Bluff Diversion Dam, both within my Senatorial District. In addition, Congressman Doug Bosco is working on legislation to implement further recommendations requiring federal involvement from the SB 1086 Plan. I am enclosing a copy of the Plan for your perusal. I would like to see the Bureau continue their efforts to assist in resolving the fishery problems in the North State. This important industry contributes significantly to the economic stability of this area.

I would also like to encourage you in your efforts to support and promote the same type of cooperation that was forthcoming in the SB 1086 Action Team and Advisory Council groups to help resolve other water problems in California. Truly, it does take a great deal of work to bring together such a diversified group and have a consensus on various solutions to problems, but my legislative efforts prove that it can be done. I am hopeful the federal government will take the lead in this direction. Cooperation among the many agencies and private interest groups is the key to resolving California's water problems.

Thank you for allowing me to share my thoughts with you on this serious and important issue.

Sincerely,

JIM NIELSEN

cc: Northern California Water Task Force

STATEMENT OF THE
TEHAMA-COLUSA WATER USERS ASSOCIATION
SUBMITTED FOR THE RECORD OF FIELD HEARING OF U. S. SENATE WATER AND POWER SUBCOMMITTEE
SACRAMENTO, CALIFORNIA
AUGUST 29, 1989

The Tehama-Colusa Water Users Association appreciates the opportunity to submit this statement for the record of this Subcommittee's Field Hearing. The Association was pleased that the Chairman devoted an entire day to the hearing, with obvious substantial preparation beforehand, thereby revealing an interest in California water issues seldom demonstrated by representatives of non-Reclamation states.

This Association is composed of 22 regular and associate members, representing 156,000 irrigable acres in the Northern Sacramento Valley of California. The districts derive their water supplies from the Tehama-Colusa and Corning Canals, which are served by the Red Bluff Diversion Dam (RBDD). The area is recognized under state law as an area of origin of the waters of the Sacramento River and therefore should be entitled to enjoy certain priorities for the allocation of CVP water. At times the Bureau's policies appear to ignore these protections.

Another important factor of this area is that, unlike the more fertile soils and longer growing seasons of the lower Sacramento and the entire San Joaquin Valleys, the cropping patterns of this service area are less flexible. Notwithstanding that fact, however, to the extent that it has been economically feasible, many farmers in this area have changed their operations to shift from lower value grain crops to higher value products such as seed crops, tomatoes, almonds and wine grapes. Much of this change is a result of the financial burdens (and the benefits) of the canal projects.

Substantially all of the land the Association districts serve is provided water through fully metered, underground pipeline systems. As a result of changes in the Reclamation Law, both with respect to acreage limitation and operation and maintenance deficits, the water costs for the farmers in this area have typically at least doubled in recent years. This has, as yet, resulted in no significant change in most districts' demand. On the other hand, it is important to note that the water supply allocations for the districts in this area, with few exceptions, are for no more than 3 acre-feet per acre, and in many cases are less than that.

All of the districts have water conservation plans which do more than occupy space in a file cabinet. As noted above, most of the water is delivered through meters, and many farmers employ on-farm recirculation systems or have agreements with downstream farmers to pick up and recirculate any drain water. Finally, there are significant blocks of land irrigated by sprinklers and drip systems, and there have been some trials with and computer-assisted irrigation management. Nevertheless, the Association does not suggest that everything that can be done with regard to water conservation is being done. The districts, however, without exception, operate with small staffs, and do not have the financial capability to retain engineers or water conservation specialists. The Association, therefore, would welcome the Bureau's assistance, if it could be offered on a practical, local level, to improve water conservation.

The location and circumstances of this service area, however, do not lend themselves to the simplistic water conservation approach of taking lands out of production of alfalfa or rice. For example, independent studies of this area have demonstrated that little of the water diverted to irrigate rice over the amount necessary to irrigate other crops is actually consumed, that is, taken out of the state's water system. Some of the water percolates into groundwater aquifers or back to the Sacramento River, where it is reused. Additionally, it is facile to compare the total production of any one or two crops to that of California's agriculture at large and suggest that the termination of its production would be insignificant to the overall economy. Often, as in this area, these crops represent a huge percentage of a whole community's economy and the loss of those crops would impose a localized economic depression, taking advantage of the few for the benefit of the many.

The Association believes there are more constructive matters which call for our attention.

We join with many of the others who have submitted testimony to the Subcommittee in calling for an immediate authorization and appropriation for the construction of a temperature control device at Shasta Dam and a functional fish ladder at the Red Bluff Diversion Dam. The Association's membership has been a cooperative partner with the Bureau in adapting to the altered operations of RBDD. The districts recognize that a share of the capital improvements referred to above, and the many others identified as necessary for fisheries restoration will result in a significant increase in their water rates, but they also acknowledge the reality of those needs.

We are aware, however, of many ironies with respect to these fish and wildlife issues. For example, the gate-raising at RBDD for the benefit of the winter run salmon makes it impossible for the Glenn-Colusa Irrigation District to wheel water to the wildlife refuges in the Valley during months when it is particularly needed. The fish ladder would allow us then no longer to have to sacrifice one species for another. The Association also joins with many of the other witnesses in proposing that the Bureau assist in the development of groundwater supplies for the refuges for use in dry years.

On a less localized scale, while we focus on the changes in fisheries on regulated streams, biologists have noted significant losses on unregulated streams, as well, suggesting that ocean harvests, both by domestic fisherman, as well as the often illegal ocean "stripmining" conducted by Japan and Taiwan, are having their effect, too. The morning before the Subcommittee's hearing, the San Francisco Chronicle published an article, attached hereto, pointing out that a change in the Corps of Engineers directions on disposal of Bay dredging spoil may have contributed significantly in the last three years to the decline in striped bass.

With regard to the cost of these capital investments for fish and wildlife purposes, we agree with Mr. Bontadelli in his admonition that the fish and wildlife problems we are all addressing now have arisen as a result of decisions society made as a whole. Notwithstanding the opinion of some, the benefits of the Central Valley Project do not flow solely into the pockets of a few, but rather economists have identified undeniable substantial benefit to the State's and Nation's economies. The Association does not suggest that the water users should not pay a fair share of the cost of these improvements, but we must all recognize that the "beneficiaries" of these projects include all of us, water users, power users and taxpayers, and that any suggestion that the water users created the problem and therefore must pay the entire cost for any of these modifications would be selfish, shortsighted and inequitable.

The Association also offers a warning. As we stated above, we are as anxious as any group to see the fish and wildlife problems that have been identified addressed and solved, with due consideration for the interests of all the parties concerned. We note, however, that the fish facilities at the Red Bluff Diversion Dam, constructed at a cost of more than $20 million, most of which has been charged to the water users, were designed by the U.S. Fish and Wildlife Service as "state of the art". The Service recently "mothballed" those facilities, and frankly should be required to admit that they should be formally abandoned and the cost written off as nonreimbursable. The United States is spending approximately $15,000,000 to construct new fish screens, also "state of the art", at the headworks of the Tehama-Colusa Canal, most of the cost of which we presume will also be charged to the water users. Our point is that the fish and wildlife problems will not be solved by simply throwing money at them, but rather by reasoned, careful but timely exchanges of information and discussion between the fish and wildlife agencies, the water managers and power users. There is no question, though, that the temperature control device and the RBDD fish ladder are necessary immediately.

The Subcommittee has expressed interest in water transfers. The Association this year negotiated and accomplished an historic transfer of water from the Sacramento River Contractors Association to one of our member districts, Orland-Artois Water District. The experience, however, demonstrated a need for the Bureau to clarify its water transfers policy, especially with regard to the manner in which it accounts for and charges to the transferring district the costs of the water. This water transfer was made much more difficult because the Bureau's accounting policies do not allow for the establishment of a price certain for the water, before it is used. The Association is hopeful that it can work this matter out administratively, as we view this sort of transfer as one means for relieving some of the water supply pressure on our member districts.

Despite the interest and optimism in water transfers, we commend the Subcommittee not to overlook that a number of our members were induced to proceed with their pipeline projects despite inadequate contract supplies, upon the guarantee of additional supplies. The needs of this service area have been adequately identified, but inadequately met. The Association takes issue with those who suggest that water allocations and completion of the Bureau's marketing program must await the conclusion of the Bay Delta Hearings. The COA legislation (P.L. 99-546) clearly directed the Secretary to insure that all future operations, including, undoubtedly, new water contracts, will be conducted in accordance with the Bay Delta standards.

Additionally, delaying the amendment of our member districts' contracts to bring their supplies up to the levels they require undermines their ability to meet their capital repayment obligations, contributes to apprehension among the farmers' lenders, and will work a gross inequity in the event of drought cutbacks. Earlier this year, the Bureau had announced water supply reductions as a result of the third year's low rainfall. The Bureau exhibited a blind obedience to each district's "contract supply", and made allocations to each of its contractors of 50% of that contract supply. In districts which have barely over half their needed water under contract, this would have resulted in a substantially greater real reduction than the 50% allocation should have accomplished for those districts alone.

Finally, the Subcommittee expressed an interest in groundwater management. Our service area offers an example of where that requires a capital investment by the United States to complete its original project. Essentially the Tehama-Colusa Canal now "deadends" at a creek, without a regulating reservoir on the end that would provide operational efficiency, by minimizing the risk of spills. In 1980, Congress adopted P.L. 96-570, specifically authorizing Tehama-Colusa Canal service to Yolo-Zamora Water District, which is located about 2-1/2 miles below the present terminus. The Act was deemed necessary in order to lay to rest confusion regarding Congress' intent to include that District in the Canal service area. That District, and pockets of other districts in the same area already served by the Canal, portrays an area with problems of groundwater quality that Congress intended be met by a surface supply, but construction of the Canal was stopped short of its intended termination point. In order to complete the Canal as intended, to convey water to Yolo-Zamora Water District to allow that district to manage its groundwater more effectively, the Bureau should be appropriated the funds to do so. Clearly Congress has given them the authorization, but not yet the money.

In summary, the solution to some of the problems we have identified is physical, for others it is policy. Almost all will require funds, but the Association's members will contribute their share. None of the issues is insoluble, nor do we see that they call at this time for a broad Congressional declaration.

Nonetheless, we appreciate the Subcommittee's attention to these matters.

FISHING

SF CHRONICLE
Aug. 28, 1989

Bay Dumping Blamed For Decline in Stripers

BY JIM FREEMAN

CHRONICLE STAFF WRITER

Whatever happened to the runs of striped bass and halibut that cavorted in San Francisco Bay just a short time ago?

You can get as many answers to this as there are questions, but most anglers blame this summer's fishing doldrums — worse than anyone can remember — on the dumping of dredge spoils by the Corps of Engineers.

According to Mike Rugg, water biologist with the state Department of Fish and Game, the dredging and dumping "definitely could have a huge effect" on striped bass migrations in the bay. "The increased turbidity from dumping raises the amount of toxins, depresses the oxygen content and releases hydrogen sulfide, a gas that dissolves in water and is very odoriferous."

The disappearance of stripers could be, literally, a million-dollar problem because of the amount of business lost by partyboat operators and the bait and tackle industry in the Bay Area.

"In the last three years our business has declined about 50 to 80 percent," said bait shop owner Keith Fraser at Loch Lomond in San Rafael. "I think this is directly traceable to the amount of dredge

See Page E2, Col.4

Dumping Hurts Fishing Industry

From Page E1

spoils being dumped right in the middle of the bay off Alcatraz."

It isn't just the bay that's being affected. The summertime striper action along the beaches south of the Golden Gate has become distressed, too.

"The striper run this year along the Pacifica beaches was the pits," said Robin Moon at Coastside Bait II. "On the few good days, we had about 40 fishermen and at the very most, only 10 fish. Muddy water from dredging must be preventing stripers from heading our way."

The brown malaise spreads from the South Bay to outside the Gate, where a finger of mud can be found that is at least eight miles long, said Fraser. "The stripers and the baitfish they feed on avoid the dirty water like the plague because it loads up their gills and causes them to move to other spots," he said.

Don Stevens, biologist for the state Department of Fish and Game, said the striper population, which once numbered three million adults, is now down to "around one million."

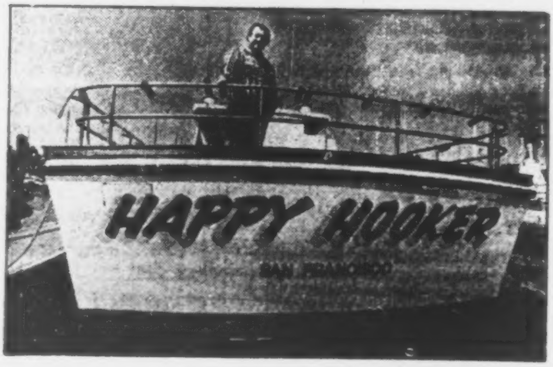
Stevens' estimates of the striper catch support the contention that the take has dropped off badly in recent years. The San Francisco Bay striper catch for 1983-87 ranges from 7 to 13 percent of the total for the fishery. In 1969-73, it went from a low of 30 percent to a high of 45 percent.

Concurrent with the decline, stripers seem to have changed their habits and habitat, he added. The bass seem to be staying in Suisun Bay and the Delta, where fishermen have been catching them at a time when the fish normally would be found in San Francisco Bay and along the beaches south of the Gate.

The Corps of Engineers has been dumping at the Alcatraz site for more than 20 years, but three years ago the agency instructed dredgers to change from scooping up mud with a clamshell dredge to mixing it as a slurry, which keeps the material about the consistency of split-pea soup and disperses it more.

When this mixture is dropped off Alcatraz, it remains suspended in the flows of tidal currents and turns the bay water into a muddy mess. Under the earlier clamshell operations, the spoils sank directly to the bottom and mostly stayed there.

"We haven't been able to find striper concentrations in the bay for the last three years," said Cliff Afinson, skipper of the Bass Tub, a live-bait fishing partyboat based in San Francisco. "I have to concentrate on rockfish and a few halibut."



BY VINCENT MAGGIORA/THE CHRONICLE

Partyboat skipper Jim Smith has stopped fishing for striped bass

Jim Smith, skipper of the Happy Hooker out of Berkeley Marina, checks his log for the bad news. He's bagged only 110 bass so far as opposed to 4,000 last June, July and August. His halibut records are just as pathetic: only 100 this season as compared to several hundred last year.

"I've changed over to rockfish and have given up striper fishing altogether," said Smith. "This has doubled my fuel bill because longer runs are involved.

"It used to be the case that you could reach under a dock and get enough mussels for hooking live shiners," he said. "Now even the mussels are gone from the bay. We are facing a biological and ecological disaster."

At one bait shop, business has dropped by more than one-third

With virtually no fish to catch, a lot of anglers have given up, causing an impact on the bait shops.

"There's no doubt about the huge drop in the striper fishery here," said Joe Thomas of Central Bait in Alameda. "We used to sell 50 to 60 dozen mudsuckers a week; now the sales are down to two dozen." As a result, Thomas has his shop up for sale.

Richard Wong at Berkeley Bait says his business has dropped by more than one-third. "The trade for the partyboats, in the case of live bait fishing, has been cut about 50 percent," he said.

State biologist Rugg said the solution would be an agreement among the Corps of Engineers, the EPA and the water quality board to prohibit the discharge of dredge material, except in an emergency, until ocean disposal sites have been designated and accepted.

"The one fact that should give us hope is that dredging has occurred for the last 20 years and it has not completely destroyed the bass runs," he said.

Dredging is not the only factor affecting the bass take in the bay. Water exports to the San Joaquin Valley farms and the intrusion of saltwater into Suisun Bay and the Delta also stress the bass populations.

Mike Carlin, environmental specialist with the Regional Water Quality Control Board, said his agency has passed measures to establish volume targets for in-bay disposal sites (which means how much can go where) and seasonal restrictions on amounts disposed in the bay. (There would be exemptions to cover small, mom-and-pop marinas.) In addition, the board wants dredge operators to prove their activity is not having an adverse effect on fish migrations, wildlife habitat or navigation, he said.

These measures have been submitted to the State Water Resources Control Board for approval, but it will take three to four months for placement on its agenda. If the state passes the amendments, implementation will occur immediately.

"Basically, the Regional Water Quality Control Board has set up a target date of December 1991 for finding a place to dispose of spoils other than at Alcatraz," says Bill Prout, information officer for the Corp of Engineers.

But will there be any bass left in two more years?

Right now, with a summer fishing season as cold as draft beer, there is little cause for anglers to be optimistic.

FRIANT WATER USERS AUTHORITY

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September 29, 1989

Senator Bill Bradley, Chairman
Water and Power Subcommittee of the Senate
Committee on Energy and Natural Resources
364 Dirksen Senate Office Building
Washington, D.C. 20510

Attention: Tom Jensen

Dear Senator Bradley:

Please accept the following as written testimony to your recent field hearing in California regarding the continuing role of the Federal Government in California water issues.

This testimony is presented on behalf of the Friant Water Users Authority (Authority). The Authority is a joint powers authority formed under state law to serve the common purposes and needs of its twenty-five member irrigation districts, water districts and municipal utility districts. All of our members are contractors for a water supply from the Friant Division of the Federal Central Valley Project. Our members provide irrigation water to approximately one million acres and some 15,000 farmers on the east side of the southern San Joaquin Valley.

The Friant Division of the Central Valley Project

Fundamental to developing an understanding of the role we see for the Federal Government in helping to resolve the water issues in our part of California, is an understanding of the abilities and the inabilities of our member districts to meet the water supply needs of the areas they serve. Developing a complete understanding of the Friant Division operations, the details of system capabilities, cropping patterns, local hydrology and the like, is difficult and time consuming. In this regard, however, I have attached our "primer" (Attachment A) on the subject and have highlighted some of the more significant points as follows:

(1) The area served by Friant water supplies is uniquely situated with soil, water and climatic conditions allowing for the growing of over 200 different varieties of tree, fruit, field and row crops. Over fifty percent of the area is planted to permanent trees and vines;

(2) The area served by Friant water supplies generates in excess of $2 billion dollars each year in gross agricultural production. This translates to something in excess of $7 billion dollars each year to the state and national economies as this produce moves from the fields to the consumer;

(3) The area served by Friant water supplies does not contribute to drainage problems nor to water quality problems in the San Joaquin River;

(4) Friant water is made available through a unique program of conjunctive use of the groundwater reservoir underlying the districts. Additionally, transferring water from areas of surplus to areas of need has been common practice in the Friant Division since its inception. These programs are years ahead of their time in an effort to optimize the use of the resource;

(5) Our farmers are world renown for applying the latest practical irrigation technologies. Additional high cost conservation efforts would not yield additional supplies for other purposes, but instead would help to offset existing groundwater overdraft problems;

(6) The area served by Friant water supplies is water short - needing additional water, not less;

(7) Limited storage in Millerton Lake (Friant Dam) and the tremendous variability of runoff on the San Joaquin River severely restricts operational flexibility for consideration of additional water needs or other uses;

(8) The farming system within the area served by Friant water supplies consists primarily of small family farms, averaging only some 63 acres in size.

Renewal of Water Service Contracts

By far the most significant and serious issue currently facing the Friant Division contractors is the renewal of their existing contracts for water service with the Federal Government. What was originally assumed to be, and by all rights should be, a "non-event" has developed into what we deem to be a very serious threat to our way of life and our economic viability.

I have enclosed some issue papers (Attachments B and C) which have been prepared over the past several months regarding some of the issues surrounding the water service contract renewal controversy. Additionally, I have included some documents that pertain to the heart of the real issues at hand, as follows:

(1) The legislative history to Public Law 84-643 which clearly details the contractor's right for renewal of their contracts for the same quantity and certainty of supply (Attachment D);

(2) The legal opinion of water attorney Kenneth A. Kuney which describes the primacy of state law in regard to the allocation of water resources and the responsibilities of the Federal Government as "trustee" of the water rights for the beneficiaries of the Friant Project (Attachment E);

(3) A copy of the water right decision of the State of California (No. D935) providing for the diversions at Friant Dam (Attachment F);

(4) A copy of the recently executed renewal contract for the Orange Cove Irrigation District which specifically requires the contract to be subject to the outcome of the lawsuit addressing the question of whether environmental impact statements are required for simply renewing these water service contracts; further, the contract clearly provides that the availability of water is dependent upon the water rights as obtained and potentially modified by the State of California (Attachment G).

It is important that you look beyond the rhetoric, to the real role the Federal Government has to play in this issue. Legitimate environmental interests are being protected. The renewal contracts will be responsive to any changes that may be needed in the management of this resource resulting from either the final outcome of the NRDC vs. Houston Lawsuit or the ongoing Bay/Delta Estuary Proceedings. There is no need to further cast a cloud over the most important single component to our areas economy and way of life - our water supply.

The Need for Additional Water Supplies

As mentioned earlier, the east side of the southern San Joaquin Valley is currently water short. We extract approximately 1 million acre feet of water from our groundwater reservoir, "our savings account", more each year than is replaced either from natural or manmade recharge.

This groundwater overdraft continues in spite of the fact that the average annual runoff from all California streams is approximately 70 million acre-feet and currently only 35 million acre feet is developed and used. Only a relatively small portion of the remaining undeveloped supply is required to meet all of California's needs for the foreseeable future, including fish and wildlife enhancement. The obvious problem with this unused supply is that most of the runoff occurs north of the Sacramento/San Joaquin Delta and most of the demand exists south of the Sacramento/San Joaquin Delta.

There is a growing need for good quality water as our local communities grow to accommodate our ever expanding population.

There is a need for additional water supplies to meet the changing social values calling for the restoration and enhancement of the San Joaquin River below Friant Dam. It should be clarified that our farmers have never been against restoring salmon runs or improving wetlands habitat, but these efforts must not infringe upon existing rights and benefits of those currently putting this water resource to beneficial use. In this regard, we have been supportive of the efforts undertaken by the Bureau of Reclamation to analyze the needs of the San Joaquin River and to outline a program for its restoration and enhancement. Those that truly have the interest of this resource at heart, and not some other agenda, support this approach to development of reasonable, workable and action oriented solutions.

With the severely limited operational flexibility of Millerton Lake, there is little more that can be done to "re-operate" the existing Friant Project in order to make additional supplies available for any purpose.

We need additional storage capabilities in order to capture flood waters in wet years from our local streams. This additional storage could be in the form of on-stream storage, off-stream storage or additional banking of water in our groundwater reservoir.

We need access to water supplies that may be available in the Sacramento/San Joaquin Delta. Currently, the east side of the southern San Joaquin Valley can only access waters from the Delta in a very limited way. Any serious consideration of restoring San Joaquin River fisheries values will have to include accessibility to water supplies in the Delta for our area. The Mid-Valley Canal is a potential solution that must be given a thorough analysis in this regard.

All of these things point towards the need to further develop an integrated regional approach to managing our water supplies in the southern San Joaquin Valley. However, this can only be done on a non-confrontational basis, where all parties feel that their rights and benefits are being fully protected. Any signs of federal mandate or unwarranted interference will only serve to forestall our efforts to further optimize the use of these natural resources.

The past roles of the Federal Government in serving as consultant and providing expertise in a water management and construction, as well as providing workable financing, must continue. However, the realm of potential issues and solutions now requires new and different expertise. A response to this need for a new expertise, is clearly being demonstrated by the Bureau of Reclamation in its new mission. This new mission has generally been well supported by the water community as we too have recognized the need for this new expertise. It is important to further emphasize that this new expertise and the associated responsibilities are in addition to, not in replacement of, their past roles in managing the natural resources of the West. Clearly, the Bureau of Reclamation is the best suited to supply this additional expertise. The recent non-constructive involvement by the Environmental Protection Agency in the water management arena has served only to polarize people on the issues and to move away from any consensus that will be required for workable solutions.

Reclamation Law

We feel it would be best to leave Reclamation Law alone for a while. We, as districts and our farmers, are just now being able to come fully to grips with the changes in the law resulting from the Reclamation Reform Act of 1982 and the associated April, 1987, regulations. We need a period of calm in order for our farmers to develop some certainty in their understanding of the law and to insure that they are obtaining the full intended benefits of the Reclamation Program for themselves and their families. We are proud of our history of full compliance with the spirit and intent of Reclamation Law.

This does not mean that we believe the law, and more particularly the interpretation of the law, are perfect - they are not.

Such things as the application of operation and maintenance deficits are unworkable in terms of our ability to avoid creating a deficit. There is no reason for this. A more businesslike approach to collection of revenues and calculation of deficits would be of benefit to both our districts, our farmers and the Federal Government.

Additionally, the draconian approach currently being taken in the determination of penalties for landowners and districts that, for relatively minor technical reasons, did not comply with all of the very confusing requirements of reporting and certification under Reclamation Law, bears looking into. Our districts are small, yet with many landowners. They maintain a minimum of staff. The reporting and certification requirements seem to have been designed with districts like Westlands Water District in mind, (big district, large staff with relatively few farmers). We're bearing the brunt of rules and regulations intended to closely scrutinize a few circumstances that pertain very little to our farming situations. Lawmakers and those responsible for implementing Reclamation Law need to make a more concerted effort to focus on the entirety of the Reclamation Program beneficiaries and not just on a few isolated circumstances.

Operation and Maintenance of the Central Valley Project

Approximately three years ago the Authority assumed, under a cooperative agreement with the Bureau of Reclamation, the operation and maintenance responsibilities of the Friant-Kern Canal.

We believe this activity has been a tremendous success from a number of standpoints. We continue to operate and maintain the facilities at an overall lesser cost to the Federal Government and to the water users, while at the same time making progress in performing maintenance on the system that had heretofore been deferred, primarily for budgetary reasons.

Additionally, it has provided the framework for an organization that can serve as a focal point to addressing the water supply needs of our area on a more regional basis, while at the same time insuring the sovereignty and integrity of the individual member districts.

The efforts associated with turning the operation and maintenance responsibilities over to the appropriate local beneficiaries should be continued within the Central Valley Project.

For the past year or two, the concept of a revolving fund to finance the operation and maintenance expense of projects operated and maintained, (all or in part), by the U.S. Bureau of Reclamation has been discussed. It now is time to bring these discussions to fruition and to put the annual funding of the operation and maintenance of these extremely important projects on a sound financial and more businesslike basis.

The following are some basic tenets that the members of the Authority feel must be included in any revolving fund legislation for the Central Valley Project:

(1) Provisions must be made to allow for contractor input and oversight. Those who contract for water and/or power are responsible for the majority of the costs associated with the operation and maintenance of these projects. The contractors must be fully involved and have meaningful input in the development of budgets, the setting of priorities and the audit of all operation and maintenance expense. Current procedures preclude anyone outside of federal officials from having meaningful participation in the development of the next year's budget, until after the federal budget proposal has been released by the President. This practice has inhibited contractor input and will not be acceptable for the preparation of the operation and maintenance budgets with a revolving fund concept;

(2) To the maximum extent possible, the funding, accounting and control of the budget and the setting of operation and maintenance priorities should lie within individual project auspices. It is our understanding that there may be distinct advantages to having just one operation and maintenance revolving fund Reclamation wide.

However, we feel that it is very important to allow for individual projects to have first access to the funds generated by the project operators. Accounting must also be done to clearly separate the actual financial obligations of each project and the revenues generated by each project. Additionally, nothing in the revolving fund design or management should inhibit the full or partial takeover of the actual operation and maintenance activities of a project by the project's beneficiaries;

(3) Provisions should be included to insure that the non-reimburseable share of the operation and maintenance expense is properly funded. Non-reimburseable expenses can make up a significant portion of a project's operation and maintenance costs. Typically, operation and maintenance activities must continue regardless of the actual funding level provided for the non-reimburseable activities. Provisions should be made to insure that the non-reimburseable share of the operation and maintenance expense will be funded and made available on a timely basis. Needed operation and maintenance activities cannot be "held hostage" while consideration is given as to whether a nonreimburseable expense is funded.

We appreciate the opportunity to have provided this committee testimony on all of these issues. Please feel free to contact us if you have any questions on the information supplied herein or on any related matter.

We look forward to your participation as a constructive player in the development of solutions to the many complex issues now facing California's water users.

Very truly yours,

Richard M. Moss
General Manager

RMM:mb

BEFORE THE
UNITED STATES SENATE
SUBCOMMITTEE ON WATER AND POWER
OF THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES

FIELD HEARING ON
CALIFORNIA WATER RESOURCES
SACRAMENTO, CA
AUGUST 29, 1989

STATEMENT OF
CEIL HOWE, JR.
WESTLAKE FARMS, INC.
STRATFORD, CALIFORNIA

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Submitted: September 12, 1989

BEFORE THE
UNITED STATES SENATE
SUBCOMMITTEE ON WATER AND POWER
OF THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES

FIELD HEARING ON
CALIFORNIA WATER RESOURCES
SACRAMENTO, CA
AUGUST 29, 1989

STATEMENT OF
CEIL HOWE, JR.
WESTLAKE FARMS, INC.
STRATFORD, CALIFORNIA

I appreciate this opportunity to provide the Subcommittee with information regarding the agricultural operations of Westlake Farms and our efforts to irrigate and drain our production acreage in an efficient and environmentally-sound manner.

Westlake Farms is a family farming corporation located in Kings County, California. We own and lease approximately 60,000 contiguous acres along the Tulare Lake Basin on which we produce seed alfalfa, small grains and cotton (See Attachment A). All of our land requires irrigation in order to be productive and receives water from riparian and appropriative Kings River supplies, the State Water Project and a small amount from the Federal Central Valley Project. In a normal growing year, we will utilize approximately 80,000 acre-feet of water; however, this year, due to a Valley-wide shortage of water, nearly forty percent of the acreage is idle.

While irrigated water is an essential part of our farming operation, its use has created operational and environmental challenges because our part of the southern San Joaquin Valley lacks sufficient natural drainage. The soil is characterized by heavy amounts of clay and is underlined by impermeable layers of additional clay. As a result, irrigation water, with its concentrations of salt, becomes trapped atop the clay layers, eventually rising into the crops' root zone. Over time, this accumulation of near-surface water throughout the Tulare Lake Basin can significantly reduce crop yields on approximately 400,000 commercially-farmed acres.

In the early 1980's Westlake began experiencing significant crop production reduction, approaching fifty percent. Consequently, it became increasingly clear to Westlake Farms that we had to invest in developing and constructing a farm-wide drainage system. Since then, we have pursued that process in cooperation with appropriate State and Federal agencies and presently have pending before the California Regional Water Quality Control Board permit applications for nearly 1,300 acres of evaporation basins serving 4,500 acres of production land. Similarly, more than two dozen other farms located in the Tulare Lake Basin have submitted applications to operate evaporation basins to drain an additional 50,000 acres of crop land.

A basic drainage and evaporation system is comprised of a series of perforated collector and main transport lines located between six to eight feet below the surface. They capture subsurface water and carry it to discharge canals. In turn, these canals deliver the water to evaporation basins. Our experience at Westlake Farms with our drainage and evaporation system has been both beneficial and instructive. As a result, we have undertaken a series of modifications in the basic system design which are intended over time to enhance our agricultural productivity and to reduce the need for and the environmental impact of evaporation basins.

For example, we have discovered that most of the crops produced on our acreage require soil drainage to a four and one-half foot depth. Consequently, new installations of perforated collector lines have been set at five feet, instead of the traditional depth of six to eight feet. In turn, we have raised the level of the main transport lines and eliminated their perforation. As a result of this new design and installation, Westlake Farms has significantly reduced the mass of land subject to drainage and the resultant volume of water requiring evaporation in basins. Moreover, we anticipate that over time, as salinity and other minerals are continually leached from the surface root zone, the quality of the drainage water will progressively improve.

Ultimately, we expect to be able to recycle this "purified" drainage water for use in irrigation, thereby reducing significantly, and perhaps even eliminating, the need for evaporation basins. In the interim years, Westlake Farms is experimenting with certain commodities whose productivity may be either immune or resistant to the current level of salinity in drainage water. For example, we are irrigating thirty acres of eucalyptus trees with drainage water which would otherwise be directed towards evaporation basins.

In addition, Westlake Farms is funding research at the University of Arizona to determine the viability of producing atroplyx with drainage water and marketing it as a feed supplement for livestock. Also, we are studying the possible use of atroplyx as a filter to remove certain elements, such as selenium, from the water. If successful, we believe that these experiments with eucalyptus trees and atroplyx may collectively have the potential of reducing by seventy-five percent the volume of water being discharged into evaporation basins.

Under present circumstances the existence and use of evaporation basins is essential to sustain an economically-vibrant agriculture industry in the Tulare Lake Basin and throughout many sections of the southern San Joaquin Valley. Nevertheless, as discussed above, Westlake Farms is pursuing both engineering modifications and horticultural alternatives that will reduce the volume of drainage water flowing to evaporation basins.

It is important to remember, Mr. Chairman, that the development of drainage systems and the construction of evaporation basins was borne by an agricultural necessity. Without their existence a significant portion of our nation's most productive agricultural areas would be rendered worthless. Farmers, like Westlake Farms, never intended their evaporation basins to replace or supplement existing wildlife habitats.

On the other hand, Westlake Farms believes that basin operators, such as itself, do have an affirmative obligation to ameliorate the basins' impact upon the area's waterfowl. In that regard, Westlake Farms has been cooperating with the California Department of Fish and Game, which has responsibility for protecting the state's waterbird population, in order to minimize any adverse effect due to the evaporation basins. The culmination of these on-going discussions occurred last December with a precedent-setting "Waterbird and Waterfowl Monitoring and Mitigation Agreement" between us and the department--the first such agreement between a basin operator and the State of California (See Attachment B).

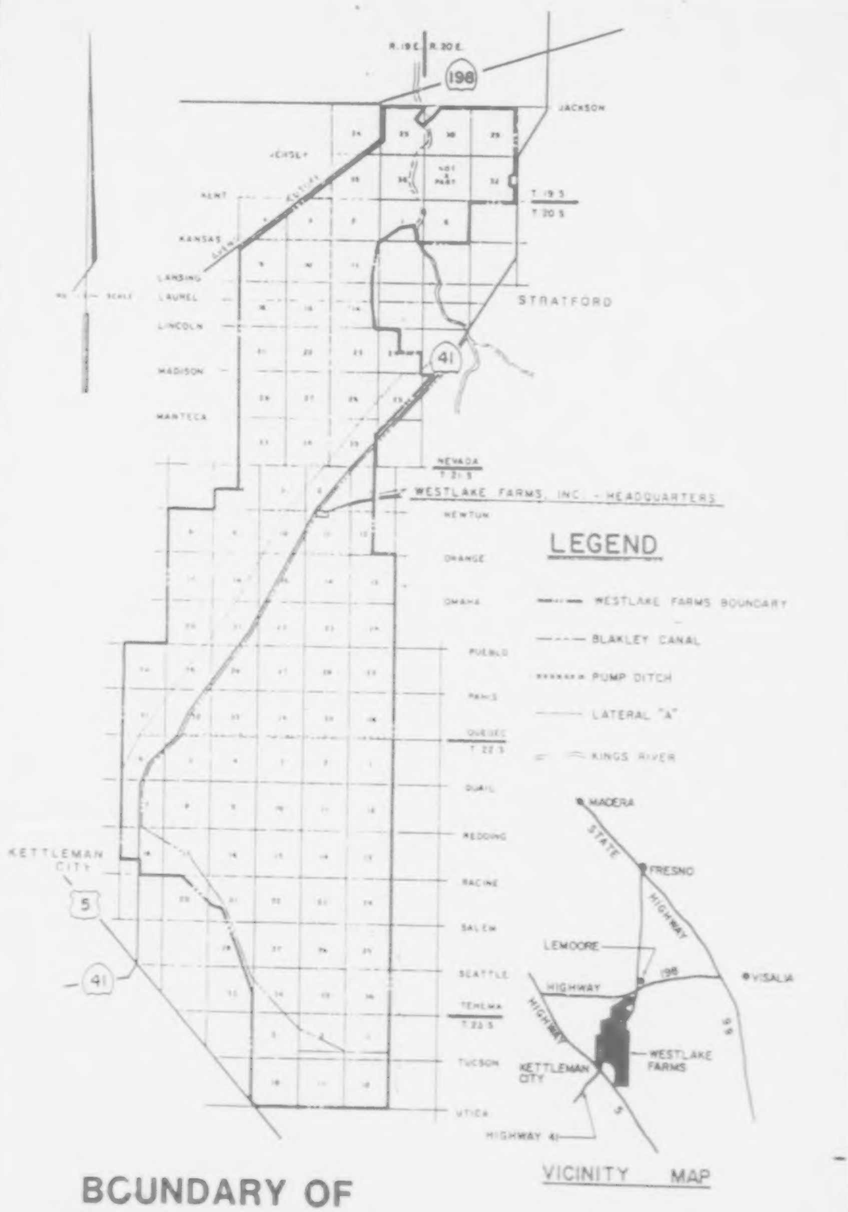
According to the terms of the understanding, Westlake Farms has begun to implement a series of "best management practices" regarding the basins, including their structural compliance with all requirements set forth in the California Environmental Quality Act. In addition, we are maintaining minimum water depths in the basins; removing perimeter and water vegetation; operating a daily bird hazing program; conducting a disease surveillance and control program; funding annual, salinity level sampling by the State; and providing California officials with year-round access to monitor adherence to the agreement.

Cumulatively, the effect of these management practices is to mitigate the impact of evaporation basins upon waterbirds and waterfowl in the area. To minimize further their exposure to selenium through food consumption, Westlake Farms is funding research at the University of California at Davis. This five-year, $250,000 study is intended to identify the transfer--or "uptake"--of selenium in various stages of the food chain and to develop strategies to disrupt its harmful biomagnification.

Throughout this field hearing, Mr. Chairman, their has been significant discussion about the appropriate role and responsibility of the Bureau of Reclamation in resolving the drainage problem in the San Luis Unit of the Central Valley Project. We are not unmindful of these issues; however, our approach to this situation is very different Westlake Farms is prepared to fund necessary research and to implement appropriate and feasible mitigation measures. It is our expectation that appropriate State and Federal agencies will continue to cooperate with our efforts to improve the agricultural efficiency and environmental compatibility of our evaporation ponds.

In summary, Mr. Chairman, I hope that our statement indicates the dual commitment of Westlake Farms to maintaining our agricultural productivity, while protecting our Valley's environment. We have much invested in achieving both of these complex, but potentially complementary goals. We realize that the cooperation of both the State and Federal governments is essential, and we look forward to continuing to work together.

ATTACHMENT A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NEWTON
ORANGE
OMAHA
PUEBLO
PARIS
QUEBEC
T. 22 S
QUAIL
REDDING
RACINE
SALEM
SEATTLE
TEHEMA
T. 23 S
TUCSON
UTICA
KETTLEMAN CITY
5
41
LEGEND
WESTLAKE FARMS BOUNDARY
BLAKLEY CANAL
PUMP DITCH
LATERAL "A"
KINGS RIVER
MADERA
STATE HIGHWAY
FRESNO
LEMOORE
198
VISALIA
HIGHWAY
HIGHWAY
99
WESTLAKE FARMS
KETTLEMAN CITY
5
HIGHWAY 41
VICINITY MAP

BOUNDARY OF WESTLAKE FARMS

McGLASSON & ASSOCIATES
CONSULTING ENGINEERS
FRESNO, CALIFORNIA
DOCUMENT #14850705

ATTACHMENT B

WATERBIRD AND WATERFOWL MONITORING AND MITIGATION AGREEMENT

WHEREAS, The California Department of Fish and Game (DFG) has general responsibility under provisions of the Fish and Game Code to preserve and protect the State's fish and wildlife resources; and

WHEREAS, Westlake Farms, Inc. (Westlake) owns and operates a farming operation in Kings County; and

WHEREAS, Westlake farms land that overlays a perched water table which creates salinity problems for its crop production; and

WHEREAS, Westlake has installed and proposes to install additional subsurface drain systems on its farm in order to control soil salinity and thereby maintain and enhance productivity, and

WHEREAS, Westlake proposes to dispose of drainage water by the continued operation of existing subsurface agricultural drainage evaporation ponds (ponds) and by the construction of additional ponds, and

WHEREAS, Westlake has existing and proposed ponds located near the intersection of Kent Avenue and Highway 41 and southeast of Kettleman City and adjacent to the Blakeley Canal. All ponds are in Kings County, and are identified on the attached map, and

WHEREAS, the operation of ponds has in some instances created conditions injurious to waterbirds and waterfowl, and

WHEREAS, operation of ponds can be accomplished in a manner that will substantially reduce the incidence of waterbird and waterfowl disease and toxicity, and

WHEREAS, additional information about controlling acquatic organisms in the food chain in ponds is necessary before a long term solution to disease and toxicity problems can be found.

NOW, THEREFORE, be it resolved that DFG and Westlake freely and willingly agree to the following measures to insure that the impact of Westlake's ponds on waterfowl and waterbirds will be as low as possible:

1. The construction and design of all ponds will comply with all California Environmental Quality Act requirements, and will to the extent possible insure:

a) that the operating water depth will be at least two feet except during draining or filling which shall be done as quickly as possible;

b) that levee slopes are as steep as practicable considering erosion and other conditions;

c) that no internal levees shall be constructed within the ponds;

d) that all vegetation is removed from the ponds prior to filling; and

e) that DFG has year-round access to all ponds by truck and airboat.

2. A waterfowl and waterbird disease surveillance and control program shall be implemented in all ponds as follows:

   a) Westlake shall observe the ponds to watch for dead birds: (1) weekly throughout the year, and (2) daily from May through October whenever the ponds are less than two feet in depth or whenever a botulism outbreak is occurring in the area. Any dead birds shall be reported to DFG immediately and birds shall be collected and held for analysis as specified by DFG. (3) In the event that a fowl cholera outbreak occurs, daily surveillance will be necessary.

   b) If a botulism or fowl cholera outbreak is identified, Westlake shall implement a program approved by DFG to pick up and dispose of dead birds.

3. DFG shall contract with a consulting firm or appropriate public institution to sample invertebrates in all ponds and have the samples analyzed by an approved laboratory. The cost of this program for the Westlake ponds shall be born by Westlake and is expected to be approximately $125 per sample adjusted annually to reflect actual cost. Such sampling will occur annually on or near August 1. If selenium concentrations exceed 8 ppm dry weight in any sample, the following control program shall be implemented:

   a) Ponds shall be kept free of emergent vegetation when possible and all perimeter vegetation, living or dead, shall be removed.

   b) If DFG determines that a significant fish population exists, Westlake and DFG will develop a fish removal plan.

c) To discourage waterbird feeding and nesting and to minimize waterbird use on ponded areas for rafting, a program of bird hazing shall be initiated and conducted by Westlake.

The hazing program for waterfowl and waterbirds shall include, at a minimum, a routine daily disturbance program designed to keep birds moving. Such program shall include the utilization of cracker shells and visible activity with a concentration of activity in the early morning and late afternoon periods. Westlake is encouraged to try new methods of hazing in order to find more efficient hazing practices.

The hazing program for waterbirds shall include, at a minimum, a routine daily disturbance program designed to diminish the attractiveness of pond shorelines. Such programs could include daily mechanical disturbances of the shoreline by dragging harrows across the shore or by other similar procedures. These procedures could be conducted concurrently with procedures to haze waterfowl. These procedures shall be discontinued at the first indication of waterbird nesting.

Additional procedures may be instituted pursuant to mutual agreement by DFG and Westlake.

4. Westlake shall provide year-round access to DFG and their cooperators for the purpose of implementing this agreement.

5. DFG will cooperate with Westlake to design and conduct a research program to determine if methods exist to control or eliminate the invertebrate food chain in the ponds.

6. Westlake and DFG shall meet annually to update and if necessary revise this agreement.

Dated: December 1, 1988

Ceil Howe, Jr.
Westlake Farms, Inc.

George D. Nokes

George D. Nokes
Regional Manager
California Department of
Fish and Game

STATEMENT OF THE HOOPA VALLEY TRIBE
HOOPA VALLEY INDIAN RESERVATION
HOOPA, CALIFORNIA

How U.S. Bureau of Reclamation Management of the Central Valley Project Breaches The Federal Trust Duty To Protect Hoopa Tribal Rights In The Trinity River

Presented to the
United States Senate
Committee on Energy and Natural Resources
Subcommittee on Water and Power

For the Record of the Oversight Hearing on California Water Controversies and the U.S. Bureau of Reclamation, Conducted on August 29, 1989 in Capitol Building, Room 112, Sacramento, California

Prepared by: Stephen H. Suagee
Staff Attorney
Hoopa Valley Business Council

Date: September 13, 1989

Legal Department
Hoopa Valley Business Council
P.O. Box 1348 • Hoopa, California 95546 • (916) 625-4211

Stephen H. Suagee
Staff Attorney

A. INTRODUCTION:

The Hoopa Valley Business Council, recently reconfirmed by Congress as the exclusive governing authority of the Hoopa Valley Tribe and the Hoopa Valley Reservation in northern California, *see* Pub. L. 100-580, the Hoopa-Yurok Settlement Act, 25 U.S.C. § 1300i-1(a) and (b) and 1300i-7, submits this Statement with Exhibits on behalf of the Hoopa Valley Tribe for the record of the Subcommittee's August 29, 1989 Oversight Hearing on California Water Controversies and the U.S. Bureau of Reclamation (BOR). The Hoopa Valley Reservation is located along the lower 14 miles of the Trinity River, and since 1981 the Interior Department has recognized its trust duty to protect the Tribe's fishing rights and reserved instream water rights in the Trinity River. Unfortunately, through its mismanagement of the Central Valley Project's Trinity River Division, approximately 70 miles upriver from the Hoopa Valley Reservation, the BOR's Mid-Pacific Regional Office has failed to protect Trinity River fishery streamflows in a manner consistent with the obligations recognized by the Department.

The Tribe has taken an administrative appeal to Interior Secretary Lujan seeking relief from certain abuses by the Mid-Pacific Region that arise under a 1981 Secretarial Issue Document (the SID, Exhibit 1), which established the current policy for fishery streamflows released into the Trinity River from the BOR's Lewiston Dam. Until the issues we raise have been properly resolved, the "integrated" nature of CVP operations presents a situation under which virtually every major action of the CVP has the potential to adversely affect the Tribe's rights in the Trinity River. For this reason, BOR administration of the Trinity River Division presents in microcosm many of the CVP-wide issues discussed by the witnesses at the August 29 Oversight Hearing, particularly with regard to what can best be characterized as "secret discretion" -- i.e., unreviewable policy decisions effectively disguised as operational decisions without reference to any appropriate administrative law standards.

B. **BACKGROUND**: The Hoopa Valley Tribe and Reservation; Fishing and Water Rights; Disastrous Impacts of the Trinity River Division Dams; The 1981 Secretarial Issue Document.

1. The Hoopa Valley Tribe and Reservation

Since time immemorial the Hupa Tribe (organized for most of this century as the Hoopa Valley Tribe) has lived in the alluvial valleys and mountain forests adjacent to the lower Trinity River in what is now known as eastern Humboldt County, California. See Map attached at end of this Statement. The Tribe has always relied on the Trinity River's abundant salmon fishery for basic subsistence, cultural, and ceremonial needs. There are at least eight aboriginal ceremonial sites located in the riparian area of the Trinity River in Hoopa Valley (the main inhabited portion of the Hoopa Valley Reservation) that are still in use today as they always have been. Every other year in September, hundreds of tribal members (total tribal enrollment is roughly 1800) participate in the 10-day White Deerskin Dance, followed by the Jump Dance ceremony. These are the highest ceremonies of the Tribe, performed to promote the renewal of all creation and to restore the balance of life and the people's place in that balance. One feature of the White Deerskin Dance is the Boat Dance, in which the dancers navigate a stretch of the River in redwood dugout canoes, in order to maintain the people's contact with departed ancestors and to provide for their needs in the spirit world. Salmon is an integral part of the meals served to all comers throughout both major ceremonies. In short, the Trinity River and its fishery have always been and still are at the heart of the religion, subsistence, and cultural identity of the Hupa people.

The Hoopa Valley Reservation was established pursuant to an 1864 Act of Congress that authorized four reservations in California "for Indian purposes."[1/] 13 Stat. 39. The boundaries of the Reservation were proclaimed in 1864, and the Hoopa Valley Reservation was finally established by an Executive Order issued in 1876. In 1891, a second Executive Order extended the

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[1/] The Tribe also entered into two treaties with agents of the United States, in 1851 and 1864, both of which guaranteed the Tribe a reservation in its aboriginal homelands along the Trinity River, but neither of these were ratified by the Senate.

boundaries of the Hoopa Valley Reservation to include aboriginal Yurok tribal lands along the Klamath River from its confluence with the Trinity to the Pacific Ocean. The legal consequences of this 1891 Executive Order gave rise to almost 30 years of litigation, commencing in 1963, regarding precisely which tribes and individual Indians held property and political rights in the original Trinity River portion of the Reservation. As mentioned above, with the recent enactment of the Hoopa-Yurok Settlement Act, Congress undid the unforeseen consequences of the 1891 Executive Order by partitioning the Trinity and Klamath River portions of the formerly unified Reservations, and has confirmed the Hoopa Valley Tribe's exclusive beneficial ownership of, and tribal government authority over, the Hoopa Valley Reservation as it was established in 1876. Currently, over 95% of the Reservation's 89,000 acres remain in unallotted trust status.

2. Hoopa Fishing and Water Rights

The 1864 Act remains a basic legal authority for the Reservation, and the Ninth Circuit has interpreted its "for Indian purposes" clause as confirming aboriginal tribal fishing rights that may be exercised free of state regulation. United States v. Eberhardt, 789 F.2d 1354, 1359 and 61 (9th Cir. 1986); Blake v. Arnett, 663 F.2d 906, 911 (9th Cir. 1981). See also People v. McCovey, 36 Cal.3d 517; 534, 205 Cal. Rptr. 643, 653, 685 P.2d 687, 697, cert. denied, 469 U.S. 1062 (1984); Mattz v. Superior Court, 250 Cal. Rptr. 278, cert. denied 109 S. Ct. 1529 (1988). The Tribe regulates on-reservation fishing under its own statutes, which are enforced by Tribal Police and in the Tribal Court. The Tribe also raises and releases salmon, maintains a state of the art watershed rehabilitation program, and plays a central role in cooperative fisheries management through participation in the Klamath Fisheries Management Council and the Pacific Fisheries Management Council.

The Interior Department has recognized that by confirming an aboriginal fishing right, the 1864 Act and 1876 Executive Order also reserved sufficient flows in the Trinity River to make tribal fishing rights meaningful. The 1981 Secretarial Issue Document (SID) established a policy of improved streamflows for the Trinity because the Department recognized it had an obligation to protect the Tribe's rights. See Exhibit 2, three 1979 Memos of the Associate Solicitor, Indian Affairs, and Exhibit 1, the 1981 SID, which quotes the memos extensively and effectively adopts their conclusions as Departmental law.

3. Disastrous Impacts of the BOR's Trinity River Division Dams

The Secretary was compelled to examine the Department's trust obligations because of the disastrous consequences visited upon the Trinity River salmon fishery by the operation of BOR's Trinity River Division dams, beginning in 1963-64. In those years, Trinity Dam began impounding 90% of the Trinity's annual flow and diverting it out of the basin to the Central Valley Project (CVP). One hundred nine miles of spawning habitat above Lewiston Dam (the lower and smaller of the two dams) was immediately lost forever. Below Lewiston, habitat was severely impacted by the drastic reduction in peak flows necessary to scour out deep pools, replace spawning gravel, and flush out logging debris and sediments from the basin's naturally erosive decomposed granite soils. Persistent low flows radically altered over 40 miles of the river channel in critical spawning and rearing areas below Lewiston, eliminating low velocity, nutrient rich rearing habitat in the side-channels, and carving the main channel into a trapezoidal sluice box. Vegetation encroached into the dewatered riparian areas, causing further deepening at the River's edges. Lethal water temperatures affected upstream migrants in the summer, and rocky debris blocked access to the lower Trinity's spawning tributaries. In ten years the Trinity River aged thousands of years. Over 60% of the steelhead runs, and 80% of the chinook salmon runs were destroyed. See Exhibits 1, the SID and 3, Summary of 1980 EIS.

Since 1922, the average annual flow of the Trinity River at Lewiston has been approximately 1.2 million acre feet. After the CVP began trans-basin exports, it released only 120-140 thousand acre feet into the Trinity from Lewiston Dam. The remaining 90% of the annual flow was stored in 2.5 million acre feet capacity Clair Engle Reservoir behind Trinity Dam, from which water is released into Lewiston Lake, a small afterbay between Trinity and Lewiston Dams, and then exported out of the basin via tunnel to Carr Powerhouse and Clair Hill Whiskeytown Reservoir. From Whiskeytown, Trinity water is transported through Spring Creek tunnel to Keswick Reservoir, from which it is released into the Sacramento River nine miles below Shasta Dam. In the course of this journey, Trinity water falls several thousand feet, and generates hydro-power at three different dams. Because of agricultural return flows to the Sacramento River, an acre foot of Trinity water is worth 1.3 acre feet to the CVP for irrigation. Eventually, Trinity water is pumped past the Delta for export to the south through the coordinated CVP/State Water

Project system. Over the years, the Trinity River has supplied 14% of the CVP's firm yield.

4. The 1981 Secretarial Issue Document (SID)

All of the above mentioned fisheries devastation and significance of Trinity water to the CVP was fully documented in the EIS prepared in conjunction with the 1981 SID. See Exhibit 3. In the EIS, the U.S. Fish and Wildlife Service concluded that an annual fishery release from Lewiston Dam of 340,000 acre feet was the optimal volume to restore the fishery to pre-dam levels. The Associate Solicitor's memos, see Exhibit 2 concluded that the Hoopa Tribe and Reservation had a federal reserved right to instream flows adequate to restore the fishery, with a likely priority date of time immemorial, and that the Secretary was obliged by his trust duty to protect this right. A separate Solicitor's memo, included in Exhibit 2, concluded that the Secretary also had a duty to increase the fishery flows arising under the 1955 Trinity River Division authorizing legislation. Act of August 12, 1955, Ch. 872, § 2,69 Stat. 719. The narrative portion of the SID refers frequently to these legal duties and effectively adopts the Solicitors' memos as Departmental law.

While the EIS was being completed and a draft SID was circulating in 1980, BOR and FWS entered into an agreement that was attached and incorporated into the final decision. The agreement modified the preferred alterative of annual fishery releases of 340,000 acre feet by establishing criteria for determining normal, dry, and critically dry water year classifications for the Trinity River. Forecasted inflow into Shasta Reservoir, in a different basin, is the determining factor: a forecasted Shasta inflow of less than 3.2 million acre feet provides a meager critically dry year volume of 140,000 acre feet for the Trinity; a forecast in excess of 3.2 million provides a dry year volume of 220,000 acre feet; a forecast in excess of 4.0 million provides a normal year's 340,000 acre feet. The FWS/BOR Agreement cited historical data indicating that a dry or critical year should occur at a rate of 21%. The Agreement and SID provided that Fish and Wildlife would conduct a 12-year Flow Study and then make recommendations to the Secretary for a permanent fishery flow regime, and further provided that the normal year volume would not exceed 287,000 acre feet until sufficient instream restoration work had taken place to justify an FWS request for 340,000 acre feet.

The Flow Study did not commence until 1985, after Congress (1) authorized construction of Buckhorn Dam, Pub. L. 96-335, to capture sediments on Grass Valley Creek, a major tributary, and (2) enacted the Trinity River Restoration Act, Pub. L. 98-541, for which $60 million has been appropriated to perform habitat rehabilitation. The increased flows and restoration effort have improved Trinity salmon runs in the 1980s (though the numbers for wild stock apparently are inflated by probable counting of hatchery stock), see last page of Exhibit 13 Spawner Escapement Chart. Unfortunately, the restoration program is spending up to $30 million for Buckhorn Dam alone, while estimates for its life expectancy and sediment removing capacity have continually been revised downward.

More seriously, BOR administration of the flow policy has exposed some basic flaws in the 1981 SID and has improperly deprived the Trinity River of fishery flows in at least three years. The Flow Study began in 1985, which was declared a dry year by BOR, and only 250,000 acre feet were released into the Trinity. After a normal year in 1986, the BOR declared dry years for 1987 and 1988, and reduced the flows to 309 and 255 thousand acre feet, respectively.[2/] In the three Trinity "dry" years, CVP customers received full deliveries under their contracts. Moreover, data in the 1987 and 1988 Flow Study Annual Reports indicated a trend tending to confirm that dry year flow volumes significantly reduce the rearing habitat available with normal year flows. See Exhibit 7, March 29, 1989 Appeal to Secretary Lujan.

C. THE TRIBE'S ADMINISTRATIVE APPEAL UNDER THE 1981 SID:

In April 1988, after BOR declared the third dry year in the first four years of the Flow Study, the Tribe filed an administrative appeal with BOR's Mid-Pacific Region, challenging the validity of dry year flow reductions. Because BOR lacks meaningful procedures for an appeal of this type, the Regional Director waited until the water year had ended to respond. The decision was completely non-responsive, Exhibit 5, and in November 1988, we took our appeal to the BOR Commissioner. By March 1989, another dry year was likely for the Trinity, and having received no response from the Commissioner, we took our

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[2/] In late February 1989, the Shasta inflow forecast indicated a critical year, but unseasonable rains in March and April produced a normal year for 1989.

appeal to Secretary Lujan, in whose office it still sits waiting for a decision. See Exhibits 4 and 5, appeal letter to the Secretary and original Regional reply, respectively.

In its appeal, the Tribe has raised the following issues:

(1) Because the Tribe is entitled to claim the most senior right in the Trinity River, dry year flow reductions are unlawful in principle, particularly when junior CVP users receive full deliveries. (Moreover, most CVP users are required to accept reduced deliveries only in critical dry years, not in dry years; such reductions have actually occurred only once, in 1977). Use of Shasta inflow to determine Trinity releases underscores the fact that tribal rights in the Trinity are subordinated to the CVP. It is especially unfair to reduce Trinity releases by over 100,000 acre feet when final Shasta inflow turns out to be less than 100,000 acre feet below the normal year inflow threshold of 4.0 million acre feet; this happened in 1985, 87, and 88. See Exhibits 3 and 12, Tribe's August 14, 1989 letter to FWS Regional Office.

(2) The SID allows the BOR to make discretionary decisions regarding dry years without reference to legal standards that protect tribal rights. Shasta inflow forecasts are constantly updated, but in the 1985 and 1987 dry years, the BOR ignored April 1 forecasts that would have provided normal years for the Trinity, and relied on forecasts that yielded dry years.3/ On the other hand, the BOR claims it is obliged by contract to guarantee full deliveries to CVP users not later than February 15. The SID does not specify which Shasta inflow forecast to use, but since the trust responsibility requires that diversions from a tribe be "justified with precision," Pyramid Lake Tribe v. Morton, 354 F.Supp. 252 (D. D.C. 1973), the BOR is not free to pick a forecast that suits its own operational

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3/ Exhibit 13, a September 6 FWS Briefing Paper indicates that BOR and FWS have finally agreed to base the Trinity water year type on the April 1 Shasta inflow forecast. If this arrangement had been in place from the outset of the Flow Study, 1985 and 87 would have been normal, rather than dry, years for the Trinity.

agenda. Nevertheless, BOR insists that its duties under the SID are purely ministerial, and that it merely reads data and in response releases the appropriate amount of water.

(3) By "integrating," or commingling, Trinity water with other CVP waters, the BOR is able to manipulate water supply data to conceal the volume of Trinity firm yield still uncommitted and available for either the CVP or the River. This breaches Interior's duty to meaningfully account for the Tribe's trust assets. This concern is developed in Exhibit 16, Supplemental Comments on the CVP Water Marketing DEIS.

(4) Except for the 1980 EIS, environmental review of Trinity River impacts has been fragmented in a way that violates NEPA and the trust responsibility. In the absence of a Supplement to the 1980 EIS that addresses new information and judicial decisions available since 1981, further dry year flows are not permitted.

(5) BOR appeal procedures are a sham.

Shortly after the Tribe took its appeal to the Secretary this past March, we received a letter dated April 14, 1989, Exhibit 6 from the Assistant Secretary, Water and Science, which raised the Tribe's concern that Water and Science would purport to decide our appeal on behalf of the Secretary without the involvement of the Assistant Secretaries for Indian Affairs and Fish and Wildlife and Parks. Exhibit 7. We contacted the Assistant Secretary, Indian Affairs, whose office responded by promising to coordinate with Water and Science. Exhibit 8. Largely because of Indian Affairs' initiative, Interior has formed a Water Policy Council to address this and other Departmental water issues of multi-agency concern. Apparently, our appeal continues to languish because there is little opportunity for this newly formed Council to meet. On July 14, 1989 Secretary Lujan distributed an internal memo directing his senior staff to fulfill his commitment to the Special Investigations Committee of the Senate Select Committee on Indian Affairs that Interior will "consider our trust responsibility to Indians in the conduct of all of our various program operations." Exhibit 9. The Tribe has followed the Committee's Investigations and briefly testified on Trinity River CVP issues at its May 16, 1988, hearing. We remain hopeful that Interior will fulfill its commitment to the Special Investigations

Committee by directing the Water Policy Council to review our appeal and recommend the mid-course corrections we seek in the SID.

We refer to "mid-course corrections" because it appears that permanent decisions on streamflows are not possible until the FWS Flow Study makes its final recommendations in 1996-97. The Tribe is concerned that overly frequent dry year flows have been disruptive to the Study. The SID recited that flow reductions could be expected at the historical rate of 21%. In the first five years of the Study, there have been three dry years; even if nature provides normal years for the next seven years, the flow reduction frequency will be 25%. Given the BOR's penchant for falsely declaring dry years, we expect more to occur under the present SID. The Flow Study, which occurs over a discrete 12-year period, cannot wait for dry years to average out over a longer period of time.

D. RECENT DEVELOPMENTS AT THE REGIONAL LEVEL:

1. Whether to Amend the 1981 SID.

At the behest of BOR's Mid-Pacific Regional Director, see Exhibit 10, July 11, 1989 letter from Lawrence Hancock, Fish and Wildlife has stated its position on Flow Study flow needs. Exhibit 11, August 28, 1989 memo to Mr. Hancock and Exhibit ___, September 6 briefing paper to the Trinity River Task Force.[4/] FWS has chosen not to advocate amending the SID for the sake of the Flow Study, concluding that normal year volumes in certain of the remaining study years will be sufficient, in conjunction with the Study's computer modeling capability, to insure a valid Study. Nevertheless it could readily happen that nature will withhold 4.0 million acre feet of Shasta inflow in a year when the Study needs a normal year release of 340,000 acre feet. Given BOR's view of its duties under the SID as purely ministerial, simple logic indicates that Shasta inflow, rather than the judgment of FWS, will continue to dictate Trinity releases in any given year.

[4/] Pursuant to the Trinity River Restoration Act, Pub. L. 98-541, the Tribe is a member of the Task Force, and plays an active role in decisions regarding the restoration program. Much of the watershed rehabilitation work on the Hoopa Valley Reservation is funded by the Restoration Program through Indian Self-Determination Act contracts.

More to the point, the recent FWS memos at least imply that while dry year flows may not threaten the Flow Study, they do harm the fish. FWS has always advised us of this informally, and this has always been the Tribe's principal concern and contention. Unlike habitat data, salmon cannot be produced on computers; they need real water and real habitat. The 1980 EIS and the SID concluded that dry year flows would harm habitat and the fishery, and subsequent information from the Flow Study, although not strictly designed to yield interim conclusions, does indicate trends tending to confirm the optimal flow volume of 340,000 acre feet. See Exhibits 4 Appeal letter at page 8, and 11 and 13, recent FWS memos. The FWS representative to the Trinity River Task Force stated this position at the Task Force's most recent meeting on September 6, 1989. Unfortunately, the BOR has arrogated the fisheries expertise of FWS, and has institutionally disabled FWS from taking a firm stand on Trinity issues within the Department. In the case Pyramid Lake Tribe vs. Morton, 354 F.Supp. 252 (D. D.C. 1973), the district court held that under the trust responsibility, the Secretary must "justify with precision" any diversions of water from a tribe. "Judgment calls" are not permitted as a means of accommodating competing interests.[5] The Associate Solicitor's March 14, 1979 memo and the SID, Exhibits 1 and 2, quote extensively from Pyramid Lake because its "fact pattern is so similar to the situation at Lewiston Dam." Under the Pyramid Lake standard, the burden is on the Department to justify continued dry year flow reductions in light of conclusions in the 1980 EIS and subsequent trends documented in Flow Study Annual reports. But the BOR constantly attempts to thrust the burden back to the Tribe to conclusively prove that flow reductions harm the fishery.

2. Potential Temperature Problems Resulting From Mismanagement of Cold Water Resources.

Clearly the BOR is ignoring its trustee's duties, and thus far BIA and FWS have not been able to play the role in the process that their respective expertise would warrant. The BOR behaves as it does because it is interested in maximizing hydropower revenues from the Shasta and Trinity River Divisions.

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[5] CVP Operations staff frequently justify their operational decisions affecting the Trinity River as "judgment calls."

Under the pretext of protecting threatened winter run chinook salmon in the upper Sacramento, the BOR shunts huge quantities of Clair Engle's cold water resource from the Trinity basin over to the Sacramento at Keswick. Unfortunately, the cold water resource is not used in a coordinated fashion to optimize temperature regulation in both rivers. Trinity water was 48° F. this summer when it left Clair Engle and Lewiston, but because of design defects in the Spring Creek tunnel inlet, which transports Trinity water from Whiskeytown to Keswick, waters released into the Sacramento at Keswick had warmed to 55° F. (Water temperatures above 57° can harm salmon). At the same time water at the bottom of Shasta was only 50° F. See date attached to Exhibit 18. The BOR declined to release this cold Shasta water during the summer because Shasta's lowest outlet gates are not attached to turbines. The BOR asked fisheries agencies and groups to pay for the foregone hydro production. Meanwhile, summertime export of cold Trinity water has so lowered Clair Engle Reservoir that it has only a 20% chance of refill this winter. In the context of repeated dry year flow reductions, the Tribe is concerned about a warm water crisis in the Trinity next summer. Indeed, if the current late summer air temperatures persist into October, there could be warm water releases into the Trinity from Lewiston this fall. This is because Lewiston is a small afterbay, subject to rapid warming. Thus a certain amount of cold water export from Clair Engle through lewiston is necessary simply to maintain cold water in Lewiston for release into the Trinity. The Tribe could never seek to totally eliminate cold water exports, because it paradoxically could harm the Trinity fishery.

Management of the cold water resource to optimize fishery protection in the Trinity and Sacramento Rivers obviously requires a lot of subtle coordination. The Tribe simply seeks an equitable allocation of this limited resource in a manner consistent with BOR trust duties. Instead the BOR has mismanaged this resource in order to maximize its hydro-power revenues. The SID makes it clear that cost benefit comparisons of alternative uses of CVP waters are inapplicable in the context of trust duties to Tribes.

Non-tribal fishery interests have all but persuaded the State Water Resources Control Board to initiate a water rights proceeding to amend BOR permits for the Shasta and Trinity Divisions in a manner that protects water temperatures to benefit the fishery in both rivers. See Exhibit 18. Although the Tribe greatly respects the competence of the State Board, interpretation of federal trust responsibilities is beyond the State Board's expertise, and probably beyond its jurisdiction in the absence of a general stream adjudication. 43 U.S.C. § 666 (the McCarran Amendment, waiving federal and tribal sovereign immunity only for purposes of such comprehensive adjudications). Thus the State Board could fashion a cold water management scheme that complies with state law but not with federal Indian law. Since our trustee the BOR is inimical to the State Board proceeding, the Tribe will be understandably wary of it until Interior resolves our dry year streamflow appeal in a responsible fashion. It would be unfortunate if the State Board proceeding somehow triggers what would be a premature general adjudication for the Trinity in 1990 or 91.

E. THE LARGER CONTEXT:

1. Secret Discretion.

It has taken a number of pages to set forth the basics of the Tribe's current grievances with its trustee regarding Trinity streamflows. A few concluding paragraphs will help place our issues in the larger context. First, we have referred to "secret discretion" -- unreviewable policy decisions disguised as ministerial operations decisions without reference to appropriate legal standards or the expertise of other Interior agencies. CVP Operations makes a "judgment call" regarding dry years that infringes tribal water rights priorities, then tries to hide behind a ministerial interpretation of its duties under the SID. In fact, the BOR behaves as if it owes a trust duty to its customers. This is reminiscent of former Solicitor Tarr's position that Interior has a ministerial duty to renew long-term CVP contracts, which Secretary Lujan implemented by signing the Orange Cove contract in the absence of an EIS. See Exhibit 17, our comments on the Friant CEQ referral.

2. Fragmented Environmental Review.

Fragmented environmental review goes hand-in-hand with secret discretion. In general, the BOR ignores or assumes away situations that cry out for cumulative impact review of connected actions with reference to trust standards. A partial list of our NEPA concerns include:

(1) BOR's failure to eliminate dry year streamflows in the absence of a Supplement to the 1980 Trinity Flow EIS. 40 C.F.R. § 1502.9(c)(1)(ii).

(2) BOR's failure to participate in a State Board EIR process relative to 19 pending BOR Petitions to change CVP water rights permits, including at least five involving the Trinity. See Exhibit 5 and 19.

(3) BOR's failure to meaningfully address its obligations to the Trinity river in its recently withdrawn Water Marketing DEIS. See Exhibits 15 and 16.

(4) BOR's announced unwillingness to do an EIS for long term contract renewals. Trinity long term contracts expire at the end of 1990. The CEQ has concluded that NEPA applies to such contract renewals.

(5) BOR's decision not to evaluate the impacts of Water Marketing in conjunction with its recent notice of intent to prepare an EIS for the Coordinated Operation Agreement 10(h) Wheeling Contract. See Exhibit 20. The Contract would provide for the transfer of 500,000 acre feet of CVP water; manipulating such a large volume could well impose constraints on the operations of Shasta and Trinity.

(6) Use of NEPA as a shield to stall resolution of our streamflow appeal. Regional Director Hancock stated at the September 6 Trinity Task Force meeting that it could take five years to amend the SID (which was produced in one year). The Tribe views this as a ploy to "lock in" maximized hydro-power production.

The CVP is an integrated system. All waters are commingled, and separate accounting of Trinity water has been problematic because the CVP controls the operations computer. In the context of the trust responsibility, the above mentioned BOR projects are legitimately connected actions within the meaning of NEPA, 40 C.F.R. § 1508.25, and the Tribe is entitled to expect meaningful programmatic evaluation of impacts to its rights in the Trinity River in a manner sufficiently timely to prevent over-appropriation of the River or excessive operational inflexibility for the Shasta and Trinity systems.

Fragmented environmental review is especially inappropriate for the Trinity River because of several unique factors. Alone among CVP rivers of origin, the Trinity is subject to three legal constraints that compel meaningful protection of the fishery:

the trust responsibility, Hoopa reserved rights, and the mandate of the 1955 authorizing legislation to increase flows if necessary to preserve the fishery. In addition, the Trinity basin is hydrologically distinct from the rest of the CVP; it is the only basin of origin not within a CVP service area. It provides benefits to the CVP, but receives none in return. The recently withdrawn Water Marketing DEIS defined the affected environment to be evaluated in terms of CVP service areas, and then proceeded to assume away Trinity impacts virtually without discussion. See Exhibit 15.

3. Unique Aspects of the Trinity River Situation.

The Trinity basin is a unique natural resource of northern California. Historically it has supplied 50% of the fish stocks in the combined Klamath-Trinity system. A very significant commercial ocean fishery, as well as tribal and sport in-river fisheries, depend on preservation of the Trinity. As the logging industry declines, local economies become more dependent on recreation and tourism. The Hoopa Valley Tribe depends on the River for cultural and religious sustenance. Continued BOR mismanagement of the Trinity River Division will result in the utter colonization of California's North Coast by the rest of the State. If the BOR cannot be persuaded to perform its trust duties with some semblance of good faith, the only alternative to a Congressional solution would be protracted complex litigation.

E. CONCLUSION:

Through its streamflow appeal, the Tribe is seeking interim protection of normal year flows im the Trinity (340,000 acre feet) pending completion of the 12-year FWS Flow Study. Other needed interim protections involve a coordinated regime for optimal use of the Trinity-Shasta cold water resource and a meaningful accounting of Trinity waters in conjunction with realistic calculations of the remaining CVP firm yield.

Such interim protection is the proper foundation for more lasting solutions in 1996-97. Once these interim protections are in place, the Hoopa Valley Tribe will no longer find itself in the middle of every major CVP-wide issue. Moreover, because of the unique factors affecting the Trinity, such protections would not necessarily set precedent for resolution of other CVP-wide fish and wildlife issues. The federal trust responsibility to the Hoopa Valley Tribe of itself calls for special treatment of the Trinity River.

In closing, the Tribe thanks Senator Bradley, the Subcommittee, and its staff for taking the time to hold an oversight hearing in California. The Senator and staff were obviously well prepared for the hearing. If the Subcommittee desires further documentation from the Tribe, we will be pleased to provide it. We would be happy to respond to any further questions as well.

Respectfully submitted,

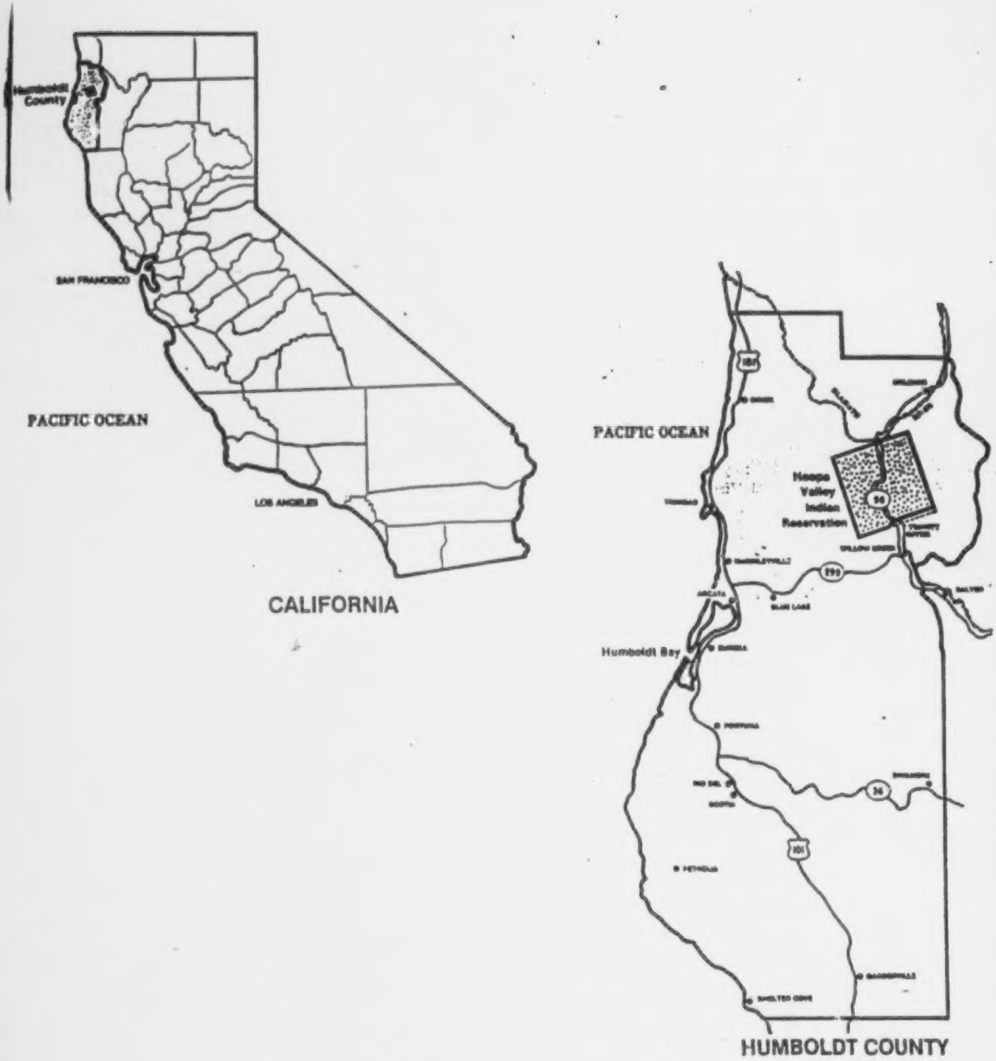
Stephen H Suagee

Stephen H. Suagee
Attorney for
Hoopa Valley Tribe

SHS/ib
Enclosures

091489senate1.wtr

FIGURE 1 - LOCATION MAP


Humboldt County
SAN FRANCISCO
PACIFIC OCEAN
LOS ANGELES
CALIFORNIA
101
PACIFIC OCEAN
Hoopa Valley Indian Reservation
96
299
ARCATA
BLUE LAKE
Humboldt Bay
36
101
HUMBOLDT COUNTY

Defenders
OF WILDLIFE

September 2, 1989

Senator Bill Bradley, Chairman
Subcommittee on Water and Power
Senate Committee on Energy and
 Natural Resources
306 Dirksen Senate Office Building
Washington, D.C. 20510-6156

Re: Testimony for inclusion in the August 29 hearing record relating to "California Water Controversy and the U.S. Bureau of Reclamation "

Dear Mr. Chairman:

Defenders of Wildlife submits this letter as our testimony for inclusion in the hearing record of the August 29 Sacramento hearing entitled "California Water Controversy and the U.S. Bureau of Reclamation."

At the outset, we generally concur with and incorporate by reference the excellent testimony submitted August 29 by representatives of the Natural Resources Defense Council, Environmental Defense Fund, Pacific Coast Federation of Fishermen's Associations, and California Waterfowl Association. For example, we endorse the recommendations submitted by Daniel Chapin, with the California Waterfowl Association, to provide reliable water supplies for California's Central Valley wetlands.

In addition, we enclose four documents which we request be included in this hearing record. The first enclosure is a copy of our detailed comments and recommendations on the Bureau's original three water contracting DEISs.

The second enclosure is a brochure describing the Central Valley Habitat Joint Venture to implement the North American Waterfowl Management Plan. One of the highest priorities of this Joint Venture is to secure "level 4" water supplies for Central Valley wetlands.

The third enclosure is a Defenders magazine, including an article beginning on page 28, entitled "More Water for Wildlife?" This article describes the urgent necessity of securing reliable water supplies for Central Valley wetlands.

CALIFORNIA OFFICE: 5604 ROSEDALE WAY, SACRAMENTO, CALIFORNIA 95822 • (916) 442-6386
NATIONAL OFFICE: 1244 NINETEENTH STREET, NW • WASHINGTON, DC 20036 • (202) 659-9510

The final enclosure is a copy of our recent testimony before the California Water Commission, describing conditions precedent which we believe are necessary before the Bureau considers CVP water contracting.

During your August 29 hearing, we believe that endangered species concerns were not adequately addressed. The Bureau and construction and operation of the CVP have played a major role in the listing and decline of many federal and/or state designated endangered, threatened, rare, and candidate species. These species include the southern bald eagle, peregrine falcon, Sacramento River winter run salmon, Swainson's hawk, giant garter snake, western yellow-billed cuckoo, and California hibiscus. Indeed, over half of California's listed species are dependent on wetland habitats, and the CVP directly and indirectly contributed to the staggering losses of Central Valley wetland habitats. Most of these listed species continue to decline, and the Bureau's water contracting program raises the appalling prospect of hastening their slide toward extinction.

We urge the Subcommittee to ensure that the Bureau's future activities are consistent with the Endangered Species Act.

We also wish to respond to the questions provided to witnesses for the August 29 hearing. These questions solicit input on how the Bureau should implement its "new mission" in California, and what opportunities exist for beneficial cooperation between California's environmental and water development interests. To respond, we believe that the Bureau must first recognize its major responsibility to provide effective mitigation for past and continuing CVP impacts on endangered species, wetlands, migratory waterfowl, fisheries, and water quality. Moreover, the Bureau must demonstrate its desire to fully comply with both procedural and substantive requirements of relevant federal and state laws, rather than the current pattern of obfuscation and isolated environmental review.

For example, the Bureau must indicate a willingness to undertake comprehensive environmental review to reconcile cumulative environmental impacts. The Bureau was repeatedly advised to prepare one programmatic EIS on their water contracting program. They refused, and instead provided three separate documents, which were confusing and largely redundant. Similarly, the refusal to conduct NEPA review on the Friant contract renewals was seen as circumventing opportunities for improved water conservation and management.

The challenge of providing reliable water supplies to Central Valley wetlands will be a major test of the Bureau's "new mission," and whether it is real or illusory.

In terms of improved cooperation, the Bureau must include California's conservationists, sportsmen, and fishermen among its constituencies, and give equal priority to conservation needs. If a positive and fair dialogue with the Bureau is established, there will be many positive opportunities for cooperation and innovative water management. The conjunctive use of ground and surface water supplies offers a number of exciting options. Wetlands can be used for groundwater recharge, flood control, and off-stream storage. Water can also be released seasonally, first to provide instream flows for fisheries, then captured for wetlands, and finally released for irrigation or other human uses.

We urge the Subcommittee to work to ensure that necessary Bureau and CVP reforms are implemented. Please also keep us informed of the Subcommittee's recommendations and actions on this subject.

Thank you very much for considering our views.

Sincerely,

Richard Spotts
rs

Richard Spotts
California Representative
Defenders of Wildlife

RS/js
Encls. 4

cc w/o encls: Tom Jensen
The Honorable Vic Fazio
Interested parties

Enclosures retained in subcommittee files.

Defenders
OF WILDLIFE

COPY

March 28, 1939

Regional Director
U.S. Bureau of Reclamation
Mid-Pacific Region
Attention: MP-750
2800 Cottage Way
Sacramento, CA 95825-1898

Re: Comments and recommendations on the Bureau's Draft Environmental Impact Statements (DEISs) for Proposed Water Contracting Programs in the Sacramento River, American River, and Delta Export Service Areas.

Dear Regional Director:

Defenders of Wildlife submits this letter as our input on the above-referenced DEISs. Please consider our input and include this letter in the appropriate public record.

At the outset, we urge the Bureau to rescind and abandon their proposed water contracting programs as described in the DEISs' proposed action. We believe that this Bureau proposed action is improper, given egregious deficiencies in the DEISs, and premature, given the failure to fulfill the water needs of endangered species, wildlife refuges, migratory waterfowl, fisheries, Delta water quality, and other natural resources.

The Bureau apparently believes that the Coordinated Operation Agreement (COA) legislation enacted by Congress somehow compels the Bureau to sell the remaining Central Valley Project (CVP) "surplus" water as soon as possible. In contrast, we believe that enactment of this legislation primarily was intended to encourage more efficient and cooperative water management between the CVP and State Water Project, rather than promoting any additional CVP water sales per se. Moreover, when former Interior Secretary Andrus imposed the moratorium on CVP water contracting, he placed several conditions which should be satisfied before this moratorium should be lifted. The COA legislation helped with some, but not all, of these conditions. The fact that the Interior Department chose to lift the CVP water contracting moratorium last fall does not change the reality that serious water problems persist, which have not been adequately addressed or reconciled.

As a general overview, it must be remembered that the once abundant and diverse fish and wildlife populations in the Central Valley were sustained by natural hydrology from rainfall and snowmelt. Rivers once overflowed their banks in most winters, sustaining massive wetland and riparian habitats. Today, the dwindling remnants of these wetland and riparian habitats are dependent upon human hydrology; to-wit, people must decide to allocate and deliver water to maintain aquatic values. Most of the Central Valley's water has been captured vis-a-vis the CVP and State Water Project, and the reality is that water-dependent species must now rely on people rather than nature. This simple reality may be overlooked by those lost in the complex minutiae of these DEISs.

Another general theme that may be overlooked is that most of the Central Valley's water which is controlled by people is already allocated for specific agricultural, municipal, and industrial uses. These human beneficiaries wish to augment their existing water rights through the Bureau's DEISs. On the other hand, with the exception of Kesterson and Modoc Refuges, none of the federal wildlife refuges in the Central Valley have any firm water rights. Thus, these refuges are at a major disadvantage, because they are starting at zero in terms of securing water rights, rather than wishing to supplement an existing supply.

The DEISs are substantially deficient, and should be withdrawn. For example, the Bureau's proposed action is not one of the alternatives presented for analysis, comparison, and assessment of cumulative impacts. We feel that it is outrageous for the Bureau to offer a proposed action for public response which is not an identified alternative in the DEISs. It is irresponsible for the Bureau to expect that the public will guess at how the proposed action may "fit" between two of the identified DEIS alternatives.

The Bureau deflects concerns about cumulative impacts under the Endangered Species Act (ESA) by indicating that these DEISs are only the first of a 2-tier environmental review process. The Bureau indicates that endangered species consultations will likely only occur on contract-specific environmental documents. This is patently ridiculous, because most of the listed and candidate species got to their precarious biological status due to the cumulative loss of wetland, riparian, and instream aquatic habitats. The most accurate biological assessment of impacts on these and other species must be done at this significant DEISs "programmatic" level. If relegated to a contract-by-contract approach, endangered species concerns are likely to become too incremental and nearly impossible to aggregate. The outcome is likely to be ESA violations, since listed and candidate species will continue to receive short shrift with respect to water allocations, and these populations will continue in their downward spiral.

The DEISs are fraudulent in maintaining that the proposed action will meet the "full needs" of wildlife refuges. In fact, refuges would only receive about 40,000 acre feet of firm yield. Arguably, this is the amount of water which Congress authorized for CVP wildlife purposes back in 1954. The other refuge water under the Bureau's proposed action would be intermittent, which is 60% available over time. Of the three categories of water allocations under the Bureau's proposed action, intermittent is the least reliable and available. The obvious problem with intermittent allocations lies in dry and critically dry years, when aquatic habitats most need water. At those times, refuge water is likely to be substantially reduced or eliminated, and refuge managers will be told to pump groundwater or purchase alternative surface supplies. At present, this is not a realistic scenario, particularly until adequate funds are provided to effectively pursue such opportunities. For example, in recent years, none of the Central Valley federal refuges has apparently pumped groundwater, and these refuges clearly do not now have adequate groundwater pumping capability. Congress has not appropriated funds for the U.S. Fish and Wildlife Service (FWS) or the Bureau to drill refuge water wells, nor to pay what may become expensive energy bills for pumping groundwater. Similarly, funds are not available in the Central Valley for the purchase of alternative refuge surface water rights. Because refuges do not achieve economic returns, they cannot fairly compete with economic interests which can profitably install wells, pay energy costs, or purchase surface water rights. Somehow, this historic and substantial disadvantage for refuges must be corrected.

The DEISs describe a long list of other activities related to CVP water contracting. The DEISs generally describe these matters in a narrative fashion without specifically reconciling how the Bureau's proposed action may reduce or eliminate options which would otherwise be available in the context of these other activities. For example, the Refuge Water Supply Investigation Report is cited and it is indicated that this study may be finalized and released to the public and Congress by December of 1989. As you may know, Defenders has urged the Bureau for over a year to release this critically important refuge water supply study concurrent with the water contracting DEISs, so Congress and the public could candidly compare, in detail, how the Bureau's proposed action interacts with refuge water supply recommendations. The Bureau cavalierly appears to believe that this study does not need to be available or reviewed in evaluating the DEISs' impacts on refuge water supplies. For the record, we wish to reiterate our position that this refuge water supply study should have been available during the public comment period on these water contracting DEISs.

The DEISs generally indicate that it is difficult or impossible to determine CVP-related impacts historically on the loss of wetlands, waterfowl, and species. While we concede that measuring these historic impacts is a difficult task, we nevertheless believe that the Bureau should have devoted greater effort to estimating these impacts to date and in preparing specific mitigation recommendations.

For example, some acreage lost and miles of canals data are provided, but no linkage with mitigation measures. Since the Bureau has failed to provide meaningful mitigation for most past CVP impacts, this pattern does not bode well when the Bureau states in these DEISs that it will prepare detailed mitigation recommendations later, presumably in the Final EISs. In other words, the Bureau seems to play an endless game of "sleight of hand" with respect to any specific mitigation measures. Ideally, the Bureau would have included in the DEISs its best possible estimate of historic adverse impacts; its recommendations for long-overdue mitigation of these historic impacts; how these historic impacts cumulatively add to the adverse impacts associated with the proposed action; and what mitigation measures the Bureau recommends for the proposed action's adverse impacts. However, the Bureau amazingly fails to resolve any of these mitigation components in the DEISs.

The Bureau uses the year 2020 for a baseline for evaluating alternatives, and their impacts. This is enormously confusing. The Bureau's assumption is that already-contracted water will be fully delivered by the year 2020, and these DEISs are additive. However, construction of delivery facilities and perhaps other activities associated with "full build out" of the already-contracted water will still be subject to future National Environmental Policy Act (NEPA) and ESA compliance. Thus, it is difficult to know the level of severity of environmental impacts during this process between now and the year 2020. Ideally, the Bureau in these DEISs should have provided a baseline for evaluating alternatives for both the current environmental status quo as well as the estimated year 2020 perspective after full build out of existing contracts. This dual approach would have facilitated public review of the DEISs, and probably eliminated much of the current confusion.

Finally, Defenders has repeatedly requested the Bureau to honestly determine what water, if any, it believes must be provided to comply with the Interior Secretary's legal duties and authorities under the ESA, Migratory Bird Treaty Act, National Wildlife Refuge Administration Act, and perhaps other major federal environmental and wildlife laws. The objective in these requests was to precipitate a reconciliation of the inherent conflicting roles of the Bureau and FWS within the Interior Department. There is, candidly, a constant "tug of war" between the Bureau and FWS on water issues, and FWS invariably loses. The outcome has meant continuing declines in endangered species, wildlife, and fisheries populations. We wonder when the Interior Secretary will decide whether endangered species, wildlife refuges, fisheries, and other aquatic-dependent resources deserve or legally require any water to sustain them. Unfortunately, despite our repeated requests, the DEISs do not set forth any interpretation of these laws as a foundation for water allocation decisions.

Defenders
OF WILDLIFE

In light of the above and other deficiencies, we believe that these DEISs violate NEPA and the Council on Environmental Quality regulations. We request that these DEISs be withdrawn. If the Bureau decides to proceed with CVP water contracting, then we recommend that one new programmatic Draft EIS be prepared, which will correct the above-referenced deficiencies and honestly describe cumulative impacts and environmental tradeoffs. However, as expressed previously, we would prefer that the Bureau abandon CVP water contracting at this time until endangered species, wildlife refuges, migratory waterfowl, fisheries, Delta water quality, and other resource water needs have been adequately fulfilled.

In addition, if we were forced to choose among the seven DEIS alternatives presented, we would support Alternative 5, emphasizing refuge and instream flow water needs, even though this alternative is not necessarily optimal from an environmental perspective, and we are confident that the Bureau is unlikely to embrace this as a new proposed action.

Please keep us, at the Sacramento address on the letterhead, fully informed on the status of these DEISs and any CVP water contracting decisions. For example, please continue to send us any subsequent meeting notices, announcements, or documents relating to CVP water contracting.

Thank you very much for your assistance, and for considering our views.

Sincerely,

Richard Spotts

Richard Spotts
California Representative
Defenders of Wildlife

RS/js

cc: Senator Alan Cranston
Senator Pete Wilson
The Honorable Manuel Lujan, Jr.
Interested parties

TESTIMONY OF RICHARD SPOTTS
CALIFORNIA REPRESENTATIVE FOR THE
DEFENDERS OF WILDLIFE
TO THE
CALIFORNIA WATER COMMISSION
ON AUGUST 31, 1989
RELATING TO THE U.S. BUREAU OF RECLAMATION'S PROPOSED CVP WATER CONTRACTING PROGRAMS FOR THE SACRAMENTO RIVER, AMERICAN RIVER, AND DELTA EXPORT SERVICE AREAS.

Mr. Chairman and Commission Members:

I am Richard Spotts, the California Representative for Defenders of Wildlife. Defenders of Wildlife is a national, non-profit, membership organization dedicated to the preservation of all forms of wildlife. I am speaking on behalf of our 80,000 members nationwide, about 14,000 of whom reside in California. I am an attorney and registered lobbyist. I have represented Defenders for nearly a decade, primarily on issues relating to endangered species, natural diversity, wildlife refuges, and marine sanctuaries.

Defenders was pleased to receive the Commission's August 14th letter inviting us to provide testimony at today's hearing. We commend the Commission for scheduling this important hearing, and we greatly appreciate this opportunity to provide our input.

In August 19th correspondence to the Commission, we submitted three items with the request that they be included in today's hearing record. These items are Defenders' detailed comments and recommendations on the Bureau's original three water contracting DEISs, a Defenders' magazine article entitled "More Water for Wildlife?", and a brochure describing the Central Valley Habitat Joint Venture to implement the North American Waterfowl Management Plan. In the absence of any objection, we will assume that these items are part of the record and we wish to incorporate them by reference in our testimony.

HISTORIC OVERVIEW

The Bureau's proposed CVP "surplus" water contracting program must not be considered in an isolated, incremental, or narrow perspective. Instead, it must be evaluated in the context of the massive cumulative adverse environmental impacts which the CVP's construction and operation has **already** caused.

The CVP has played a major role in the listing and decline of many federal and/or state designated endangered, threatened, rare, and candidate species, including the southern bald eagle, peregrine falcon, Sacramento River winter run salmon, Swainson's hawk, giant garter snake, western yellow-billed cuckoo, and California hibiscus. Indeed, over half of California's listed species are dependent on wetland habitats, and the CVP directly and indirectly contributed to the staggering losses of Central Valley wetland habitats. Most of these listed species continue to decline, and the Bureau's water contracting program raises the appalling prospect of hastening their slide toward extinction.

Moreover, the CVP's role in wetland losses has contributed to the distressing reduction in Pacific Flyway migratory waterfowl populations. These populations have dropped by 46 percent in the past 33 years, and the Central Valley supports 60 percent of the Flyway's waterfowl.

Many federal, state, and private refuges have been acquired to protect endangered species and migratory waterfowl. Unfortunately, these refuges have only secured a small fraction of the water necessary to maintain existing wetland habitats. In addition, agricultural drainage water has been a major source for wetlands, but substitute water supplies are needed given the growing awareness of contamination problems. Ultimately, to effectively recover listed species and restore waterfowl populations, it is imperative that reliable clean water supplies be provided not only to maintain existing wetlands but also to restore and enhance wetlands.

The CVP has devastated fisheries and the livelihoods of those who bring this healthful, renewable, unsubsidized, protein "crop" to market. The once mighty San Joaquin River fisheries are a memory. The Sacramento River's fisheries have been reduced by an estimated 80 percent, although they still produce $100,000,000 in annual economic benefits. The Delta's fisheries generally continue in a downward spiral. Substantial changes in CVP operations will be needed to stop these declines and give realistic hope for fisheries restoration.

CONDITIONS PRECEDENT FOR ANY FUTURE CVP WATER CONTRACTING

In light of the CVP's cumulative impacts, the new array of environmental quality and wildlife conservation laws, the overwhelming public support for meaningful environmental reforms, and the Bureau's "new mission", we believe that a number of conditions precedent must be satisfied prior to any CVP water contracting. These conditions include: effective mitigation for CVP impacts on endangered species, wetlands, migratory waterfowl, fisheries, and water quality; full compliance with both procedural and substantive requirements of relevant federal and state laws; guaranteed water supplies of suitable quantity and quality, delivered at appropriate times, to achieve conservation objectives; and a "level playing field" for conservationists, sportsmen, and fishermen among the Bureau's constituencies.

The Bureau is now at a crucial juncture. It is increasingly perceived as an atavistic agency held captive by agribusiness, and largely oblivious to evolving social and environmental priorities. A constant stream of Bureau press releases on conservation topics has generally not vitiated this public perception. The public is learning to distinguish policy pronouncements and good intentions from tangible conservation achieve-

ments. To fulfill its "new mission", restore its credibility, and perhaps even survive, the Bureau must rapidly change from a sluggish, recalcitrant bureaucracy into an efficient, adaptive, and conflict resolving agency. There are some signs that these positive changes may be underway, but much more is needed and only time will tell if these changes are real or illusory.

Defenders of Wildlife applauds Interior Secretary Lujan's May 25th decision requiring the Bureau to revise and reissue the CVP water contracting DEISs. However, the Bureau's specific "marching orders" in preparing a new set of DEISs, and the timetable for doing so, are not known. Until this information is available, the prospects for better environmental analysis and a more favorable proposed action are speculative. We hope that Secretary Lujan will direct the Bureau to address and satisfy the conditions precedent described earlier before initiating another round of water contracting DEISs.

CONCLUSION

We urge the Commission to join us in supporting these conditions precedent, and to convey this support to Secretary Lujan and Bureau officials. We further request the Commission's support for Congressional legislation and appropriations which are necessary to accomplish CVP reforms. And we encourage the Commission to aggressively pursue opportunities for water conservation, conjunctive ground and surface water management, using wetlands for groundwater recharge and flood control, and providing cheaper power rates for conservation programs.

Thank you very much for considering our views.

Richard Spotts
California Representative
Defenders of Wildlife
5604 Rosedale Way
Sacramento, CA 95822
(916) 442-6386

September 5, 1989

Honorable Bill Bradly
Energy & Natural Resources Committee
Hart Senate Office Building
Room 731
Washington, D.C. 20510

Dear Senator Bradly:

August 20th--the weather had kept me in for two days. There was still a husky lump and some wind, but the forecast was for better weather. I rolled and slopped my way out to thirty fathoms and got my hooks in the water. By noon, the initial queasyness of the first day of the trip had begun to subside, and there were ten salmon on the boat. The landings up and down the 200 mile Klamath Management Zone (KMZ) had been quite low, and I felt lucky to have ten fish. I was located. I began to feel better. I had some momentum and was settling in for the trip. By tomorrow I might have the twenty fish quota and I could catch the flood tide for a safe ride in and get right back out and start on the next twenty. I began thinking I could buy the kids some new clothes to start school with. I knew we were nowhere near the 9,200 fish quota which would close the KMZ. I had called Crescent City and Trinidad; very few fish had been landed. At two PM the Coast Guard came on channel 16 and announced NMFS director, Roland Schmitten, was closing the KMZ at midnight.

It was too late to reach the bar before the tide changed to a seven foot run out. With the closure, the law required me to be in by midnight. I was sick at my stomach, but not from seasickness. What were my choices? I could anchor behind False Cape Rock, waste half a day and the extra fuel and go back in on the 21st when it was safe and be a criminal. Or I could fish another hour and run for the bar and take a chance crossing it in a big ebb. Or I could wait until after dark when the tide changed, but I wouldn't be able to see what was coming behind me.

I decided to attempt to cross against the ebb. I had two hours to think about it as my stomach and throat tightened. Seven feet is a lot of water to run out of Humboldt Bay. It makes a big swell stand up sharply and glower. Sometimes they make the threat good. Hundreds of people have died on the Humbolt Bar, some of them my friends. The swells were sharp and brown as they lifted my stern and pushed me one way and then the other. My dog huddled up against my leg. I thought about my children. I thought about Roland Schmitten.

September 2, 1989
Page 2

The next day the ocean went flat. The party boats caught salmon. They were biting. I was confined to the dock. I called Fish and Game. State Marine Fisheries biologist, Jewellynn Lee said the quota wasn't anywhere near filled. She said they had sent this message to NMFS, but nobody seemed to care. I called back at four PM. Of the 9,200 fish quota, 810 fish had been landed in the KMZ. Mr. Schmitten found it convenient to reopen the season August 22, but they were not biting. I had six fish. I had lost my location, my momentum, and one full day of the 14 days I would be permitted to fish.

The California salmon fishing industry has been a profitable asset to itself, the coastal communities, and the state. We have never received a subsidy, and, where other industries are having difficulty with resource depletion, we are in fact increasing ours. Of one million dollars from the fishermen-financed salmon stamp program, $900,000 made it to the river for enhancement and fish propagation. Of one million federal dollars allocated to the Klamath River Basin Task Force, $10,000 made it to the river. We used to be able to make a reasonable living before the Magnuson Act provided us with federal assistance. Now, at a time when a lot of us should be putting something by for when we don't get around so well, we are just hanging on. My experience with federal management above is just one of many grains of sand dropped into the bearings of an industry and a way of life. Currently the Magnuson Act provides no mechanism for redress of grievances. It is the "if you don't like it choke it down anyway" approach. Last year federal management dictated only three days of fishing in the KMZ. There were so many fish in the Klamath River the hatchery and the river couldn't handle them all. They rooted up previously laid eggs. They knocked each other out of the river and rotted on the banks.

The current federal management of Northern California's salmon fishery is vulnerable to oil interests, southern California water interests, the myopia of federal biologists who are not accountable for their results, and the vengence and pork barreling of the bureaus of interior and commerce. Vulnerable to men like Roland Schmitten, so far removed from their jobs they are unable to make a phone call or receive input from their staff to find out if any fish have been caught.

We need energetic, accountable fishery management not political maneuvering and bureaucratic sloth and insensitivity. Can our system and the Magnuson Act deal effectively with this need? Pacific Coast Federation of Fisherman's Association's recommendation for data arbitrations would be a start.

Sincerely,

David Helliwell
F.V. Corregidor
850 Greenwood Heights
Kneeland, CA 95549

P.S. Do you suppose Mr. Schmitten will take responsibility for the financial loss to the families of the North Coast for his error in judgement and attentiveness? In good weather when the fish are biting and the rhythm of one's work is established, the loss of a day is significant. Especially in a year when mortgages are not being paid, necessary health and dental care are not accessible, and new clothes for school cannot be bought.

P.P.S. The appointees of the Magnuson Act forecasted more fish this year than last year. They cut our quota in half. Nine thousand two hundred fish of that quota were delegated to the last 14 days of August, a time of year when the fish are usually gone. They took away one of the 14 days to count fish at their convenience. In the remaining 13 days only 2,400 fish were caught. They were asked to extend the season for the remaining 6,800 fish. They refused.

Auburn Dam Council

650 Douglas Blvd., Roseville, CA 95678 • (916) 783-8136

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California Central Valley Flood
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California Farm Bureau
California Rice Industry Committee
Camray Companies
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Tenco Tractor Company
Winncrest Homes, Inc.
Wise Insurance Agent/Brokers

August 14, 1989

Tom Jensen
Water and Power Subcommittee
364 DSOB
Washington, D.C. 20510

Dear Mr. Jensen:

As I understand that appearance before Sen. Bradley's Water and Power Subcommittee hearing in Sacramento set for August 29 is by invitation only, I want to be certain your committee members are aware of feeling in Northern California regarding Auburn Dam. More importantly, that the position of the Auburn Dam Council is part of the record regarding federal water projects in the Golden State.

The Auburn Dam Council shares the concerns in relation to California's water needs. I hope the enclosed document is of some help to the Senator and the members of his subcommittee.

Sincerely,

Leo J. Papas

Leo J. Papas
Chairman

LJP/dm

Encls.

For submission to Sen. Bill Bradley
From The Auburn Dam Council
August 14, 1989
CONTACT: Chris Thompson 442-5000

A CASE STUDY FOR AUBURN DAM

by

Leo J. Papas
Chairman
Auburn Dam Council

Why do we need a multiple-use Auburn Dam? The events of the past three years demonstrate the need vividly:

* In February of 1986, the raging American River poured through Nimbus Dam at a peak torrent of 130,000 cubic feet per second. Sacramento was only minutes away from suffering a devastating flood that would have imperiled lives and billions of dollars of homes and businesses.

* Since that fateful February, the region has experienced three years of critically dry weather, forcing water districts to ration deliveries to homes and portending major cutbacks to agriculture and industry.

The growing Sacramento area cannot afford ongoing - and increasing - vulnerability to the two weather extremes of flood and drought. Completion of a multipurpose Auburn Dam is essential to protect our citizens from these twin environmental threats.

The multipurpose dam would provide a wide range of benefits for the entire region. An Auburn Dam would assure continued economic vitality and new recreational benefits to enhance our "quality of life."

A multipurpose Auburn Dam:

* Is crucial to assure an adequate supply of water for our residents. Demand for American River water is growing rapidly. Water officials say they will not be able to satisfy all the requests for the water. Fast-growing Placer County now uses 9,000 acre-feet of water from the American River, but has rights and contracts for 237,000 acre feet as delivery systems are developed for the western part of the county. The City of Sacramento is using less than one-fourth of its contract. Many other large requests for water are under contract or pending; and existing sources of groundwater, notably in Sacramento County, also are threatened by overdrafting.

As the demand grows, periods of drought make the water supply situation increasingly precarious. At a time when residents are being asked to conserve water, an expansion of new water supply sources is critical. A multipurpose dam can satisfy the demands of a thirsty populace.

* Offers environmental safeguards. Flows on the American River now can be cut to 250 cubic feet a second, a fraction of even last year's paltry flows. Poor flows and warm water temperatures the past two years have severely impacted the salmon spawning run. Water from an Auburn Dam would provide a stable flow to the American River and Delta, ensuring adequate water and temperature levels for river wildlife and vegetation.

* Provides a new source of clean hydroelectric power. The construction of new nuclear or hydrocarbon fuel power plants face major obstacles in California, which makes meeting the expected

demands for electrical energy difficult. A multipurpose dam would provide an additional nearby power source that generates safe, predictable electricity supplies.

* Offers a major new source of recreation. Auburn Dam would provide new boating opportunities and stabilize water levels at Folsom Lake, assuring dependable use of one of the state's most utilized recreational resources. (Recreation at Folsom Lake was drastically reduced during the '87 and '88 summers because of low water levels. Last year, the marina was left high and dry as the reservoir fell to less than one-fourth of capacity. Only the rains of this past March enabled boaters to re-enter -- only to be removed again this month.) Dependable flows on the American River also will provide consistent fishing and rafting opportunities for residents.

* Reduces the region's vulnerability to flooding. A multipurpose dam would reduce the pressure on downstream levees and protect the region against disastrous floods like the ones that ravaged the area in 1986. A preliminary cofferdam with a spillway can offer temporary 100-year flood protection for the area while preparations are made for a multipurpose dam.

The public agrees with the need for a multipurpose dam. Over the past two years, several opinion polls have indicated a majority support for an Auburn Dam.

A poll conducted last summer by Meta Information Services showed Sacramento County residents favored a multipurpose dam by more than a 6-to-1 margin over the dry dam proposal.

And a readers' poll in The Sacramento Union found a whopping majority of 92 percent of respondents backed a multipurpose dam.

With such a critical need and widespread support, why isn't a dam already in place? Construction on Auburn Dam began in 1967. But after the Oroville earthquake of 1975, the project stalled as the dam design was modified for seimsmological safety.

Since that time, the rules for funding federal water projects have changed. Non-federal financial participation now is required as a share of the cost. In other words, buyers for the water and power have to be found before the dam is built.

Last September, the buyers stepped forward. The American River Authority, a joint powers authority of Placer and El Dorado counties, offered to pay $700 million toward the $1.1 billion estimated cost of completing the dam. The Western Area Power Administration would market the hydropower and the Bureau of Reclamation would market the water from the dam as part of the Central Valley Project resources.

A multipurpose dam not only would provide these benefits, but also furnish flood protection more cheaply than a flow-through, or so-called "dry" dam. According to figures from the Bureau of Reclamation, the cost of flood protection from the multipurpose dam would be less than the cost of a dry dam alone. It is no surprise, then, that support for the dry dam is evaporating - the idea doesn't hold water. The multipurpose dam will fulfill the region's water, power and recreation needs, as well as offer flood control. A multipurpose dam will benefit residents both upstream and downstream.

Aside from the fore-mentioned, the environmental benefits of

Auburn -- water storage for wildlife, recreation and water quality -- are consistently overlooked. Building Auburn Dam would mean trading white water recreation above Auburn for stabilization of the environment and recreation opportunities at Folsom Lake and along the Lower American River.

Clearly, the benefits afforded by a multipurpose Auburn Dam meet a multiplicity of environmental, fish and wildlife, recreational, water, power and flood control needs for millions of people.

Auburn's construction is crucial to ensuring the region's safety, prosperity and quality of life.

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Shafter-Wasco Irrigation District

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September 8, 1989

Senator Bill Bradley
Chairman, Water and Power Subcommittee
Attn: Tom Jenson
364 DSOB
Washington, D.C. 20510

Dear Senator Bradley:

The Shafter-Wasco Irrigation District appreciates the opportunity to express its views on the very important California water issues affecting the district in connection with the Senate Water and Power Subcommittee Hearing held in Sacramento, California on August 29, 1989. Our commitment is to insure that the district's irreplaceable water resources are effectively managed and conserved.

The Shafter-Wasco Irrigation District is a long-term water service contractor of the Friant Unit, Central Valley Project. The district delivers supplemental irrigation water to 32,000 acres of crop land surrounding the cities of Shafter and Wasco. The district was organized in 1937 by Shafter-Wasco farmers to find ways and means of replenishing rapidly dwindling underground water supplies. In 1955 the district executed a contract with the United States to provide for a supplemental water supply from the Friant Unit and for the construction of a distribution system.

An item of major concern to the Board of Directors and water users of the district is water surface contract renewal. The district's contract with the United States is to be renewed in 1995. The district is deeply concerned about the financial and water supply impact of the issue of whether or not a federal Environmental Impact Statement (EIS) should be required.

The district and its farmers feel strongly that Congress answered this issue with provisions of the 1956 Reclamation Act which obligated the Federal Government to renew the subject contracts and exempted the process from requiring a EIS if no water use changes were made in the renewed contract. Department of Interior Solicitor Tarr arrived at this conclusion in his November 10, 1988, opinion after he researched the law and intent of Congress. The same conclusion was reached by Department of Interior Secretary Manuel Lujan when he made the decision to offer Orange Cove Irrigation District a 40 year contract this April. The Department of Justice has also reached this conclusion in defense of the Department of Interior in the NRDC vs. Houston lawsuit on this issue before Judge Lawrence Karlton in Sacramento, California.

Renewal of the Friant Unit contracts is not a major federal action because no changes in the enviroment will be made by the renewal of the water surface contracts. The same amount of water will be provided to and used by the same municipal and agricultural agencies that have utilized the water over the last 40 years. The same conditions will prevail after the contracts are renewed as they were before the renewal. The only changes in the contract will be price and Reclamation Law as mandated by Congress.

The preparation of an EIS is an expensive and time consuming process which is not required and totally unnecessary in the contract renewal process. The contract renewal process does not have the authority to cause a reallocation of California's water resources or to alter the Congressional authorized operation of the Central Valley Project. Therefore, any delay due to congressional action or failure by the Government to renew the water supply to complete an EIS, which has been exempted by law, will cause immediate adverse environmental effects and undermine the agricultural and urban economies of the farmers and citizens of the San Joaquin Valley.

The continuance of our irreplaceable water supply from the Central Valley Project to our water deficient area is essential to maintain the agricultural economy which has developed due to the foresight of the Central Valley Project authorization over 40 years ago. The farmers and water users of the district understand the importance of this water supply and are using the latest practical irrigation technology to conserve the irreplaceable water supply from the Friant Unit and to reduce the overdraft on our ground water supply.

Another issue of great concern to the district is additional ground water legislation. The district water users wish to express their opposition to Federal legislation, such as, HR 2320, proposed in 1987, cited as the "Reclamation States Ground Water Act". The Board views any such proposed legislation as unnecessary for the State of California and would result in extensive additional water costs and inefficient water use for the water users of this District. The Friant Unit has a long standing, very effective ground water-surface water conjunctive use program to manage the ground water supply in this area. A ground water program such as adopted in Arizona does not apply to California and would be ineffective in our area.

Ground water management legislation at the Federal or State level would not be effective in California. Such programs would not meet the local needs. They would also be detrimental to effective programs already in place. The Federal Government and the State of California already have legislation in place to protect the State's ground water supplies from contamination by toxic materials.

A third issue of concern to the district are proposals to change the 1982 Reclamation Reform Act. The distict is abiding by the law and intent of congress, and therefore, feel changes are not required or needed. The current reclamation law provides adequate sanctions for illegal deliveries of Federal irrigation water. If a farmer has received water in violation of reclamation law, he must pay full cost for that water and abide by the law or suffer the ultimate sanction of a cutoff of his water supply. The Department of Interior has been given the responsibility to administer reclamation law and is enforcing all aspects of it. The Department of Interiors' rulings and regulations are working.

Thank you for the opportunity to comment on the issues discussed at the August 29, 1989, Senate Water and Power Subcommitte hearing.

Very truly yours,

Harvey R Williams

HARVEY R. WILLIAMS
Secretary-Manager

HRW/cw

cc: Dick Moss, FWUA
Jason Peltier, CVPWA
Ernest Conant